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Command and Control

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DEPARTMENT OF THE NAVY
Headquarters United States Marine Corps
Washington, DC 20380-0001

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FOREWORD

> *"Everything in war is simple, but the simplest thing is difficult."* [1]
> - Carl von Clausewitz

> *"Time is the essence in war, and while a defeat may be balanced by a battle won, days and hours—even minutes—frittered away, can never be regained."* [2]
> - Brigadier General S. B. Griffith, USMC

War is a process that pits the opposing wills of two commanders against each other. Great victories of military forces are often attributed to superior firepower, mobility, or logistics. In actuality, it often is the commander who makes good decisions and executes these decisions at a superior tempo who leads his forces to victory. Therefore, victory demands that commanders effectively link decisionmaking to execution through the concept of command and control. Warfare will continue to evolve and command and control processes, organization, and supporting systems will continue to change, but the basic concept of command and control will remain the key to the decisive application of combat power. More than ever before, a command and control system is crucial to success and must support shorter decision cycles and instantaneous flexibility across vast distances of time and space.

The term command and control is subject to numerous and diverse perceptions. To be effectively applied, command and control must be reduced to a **common perspective**. This manual provides the Marine Corps' perspective on command and control and the Marine Corps' command and control theory, philosophy, and architecture for the MAGTF. It spans the entire spectrum of Marine Air-Ground Task Force (MAGTF) operations (strategic to tactical levels of war) as viewed by the MAGTF commander. This manual addresses command and control of MAGTF maneuver warfare applications across the operational continuum and from planning through execution phases. It stresses the importance of command and control, identifies how it integrates with the U.S. Navy command and control system, and addresses how a MAGTF commander orchestrates command and control internally within the MAGTF and externally within a joint or combined task force.

This manual presents the **philosophical underpinning** of Marine Corps command and control and the fundamental concepts that govern its application. It complements the Marine Corps' warfighting philosophy presented in FMFM 1, *Warfighting*, and MAGTF operational doctrine outlined in FMFM 2, *The Marine Air-Ground Task Force*. The tactics, techniques, and procedures for command and control will be published in follow-on publications within the FMFM 3 series. Chapter 1 explains what command and control is, how it fits within our national command structure, how it relates to the Marine Corps' warfighting philosophy, and the fundamental tools that govern its application. Chapter 2 focuses on MAGTF command and control organization and the critical role of the commander in the command and control process. Chapter 3 explains information and its impact on command and control, how to deal with information overload, and how to focus limited resources to support the MAGTF's information requirements. Chapter 4 explains how the MAGTF enables command and control through its command and control support systems and support forces.

This manual supersedes Operational Handbook (OH) 3, *Command and Control Systems*. Recommendations for improvements to this publication are encouraged from commands as well as from individuals. Forward suggestions using the User Suggestion Form format to—

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1. In accordance with the Foreword to FMFM 3, which invites individuals to submit suggestions concerning this FMFM directly to the above addressee, the following unclassified recommendation is forwarded:

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Command and Control

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Chapter 1

Command and Control Fundamentals

1001. Introduction

Command and control is essential to all Marine Air-Ground Task Force (MAGTF) operations and crucial to success in war. Command is a uniquely human dimension that principally involves decisionmaking while control involves a complex array of resources to ensure proper mission execution. **The linking of decisionmaking and execution forms the concept of command and control** (see fig. 1). The concept of command and control forms an efficient decision and execution cycle that integrates and unifies the MAGTF and provides the MAGTF commander with a way to generate swift and decisive combat power. Increasing the effectiveness of the decision and execution cycle is the key to "fighting smarter." The measure of command and control effectiveness is simple: either our command and control works faster than the enemy's decision and execution cycle or the enemy will own our command and control.

Command and control is subject to numerous and diverse perceptions. Individual perspective, based on background and experience, also narrows the scope of command and control. Therefore, if a commander is to apply command and control effectively, the commander, his staff, and his subordinate commanders must have a common perspective upon which to view command and control as a whole. The objective is to produce a common understanding of the major moving parts, to identify how the parts interrelate, and to determine the strategies involved in focusing and balancing command and control resources in order to gain operational and tactical advantage.

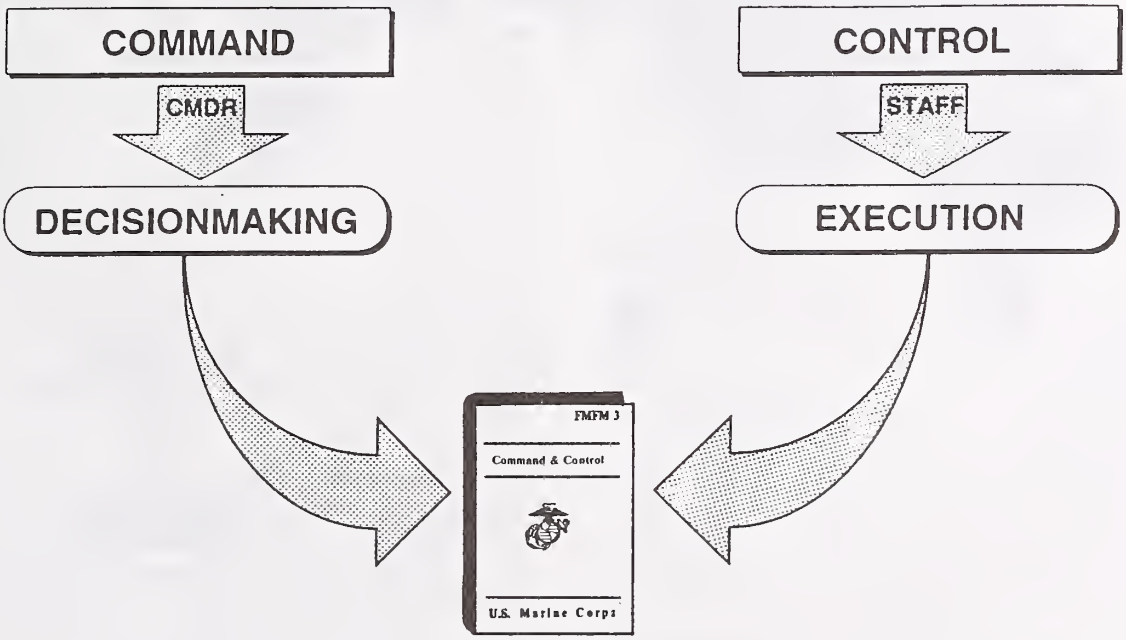

Figure 1. Linking Command and Control.

1002. Sources of Authority

The foundation for command and control is found in our Constitution, wherein the will of the people, expressed through their elected political officials, is the ultimate source of authority. Through this authority, the President, as Commander in Chief (CINC), employs the elements of national power to meet national policy objectives. If economic, political, and diplomatic efforts fail to meet national policy objectives, military power may be employed.

> *"The political object is the goal, war is the means of reaching it, and the means can never be considered in isolation from their purposes."*[1]
>
> — Carl von Clausewitz

1003. Links of Command and Control Authority

Authority is linked through the U.S.'s national command and control infrastructure.[2] This infrastructure forms a chain of command through the strategic operational, and tactical levels of war to ensure, by law, the continuity of command and the implementation of national policy objectives.

a. Command. Command authority extends from the National Command Authorities (NCA) through the Department of Defense (DOD) to the military Services. Within the DOD, command authority divides via two chains of command: administrative and operational. The administrative chain of command links authority through the DOD to its Service departments. Each Service is responsible for training and equipping its operating forces in order to maintain its wartime readiness. The operational chain of command links authority through the DOD to the CINCs of the unified[3] and specified[4] commands. CINCs of the unified and specified commands are responsible for the employment of designated Service components at the operational level of war (see fig. 2).

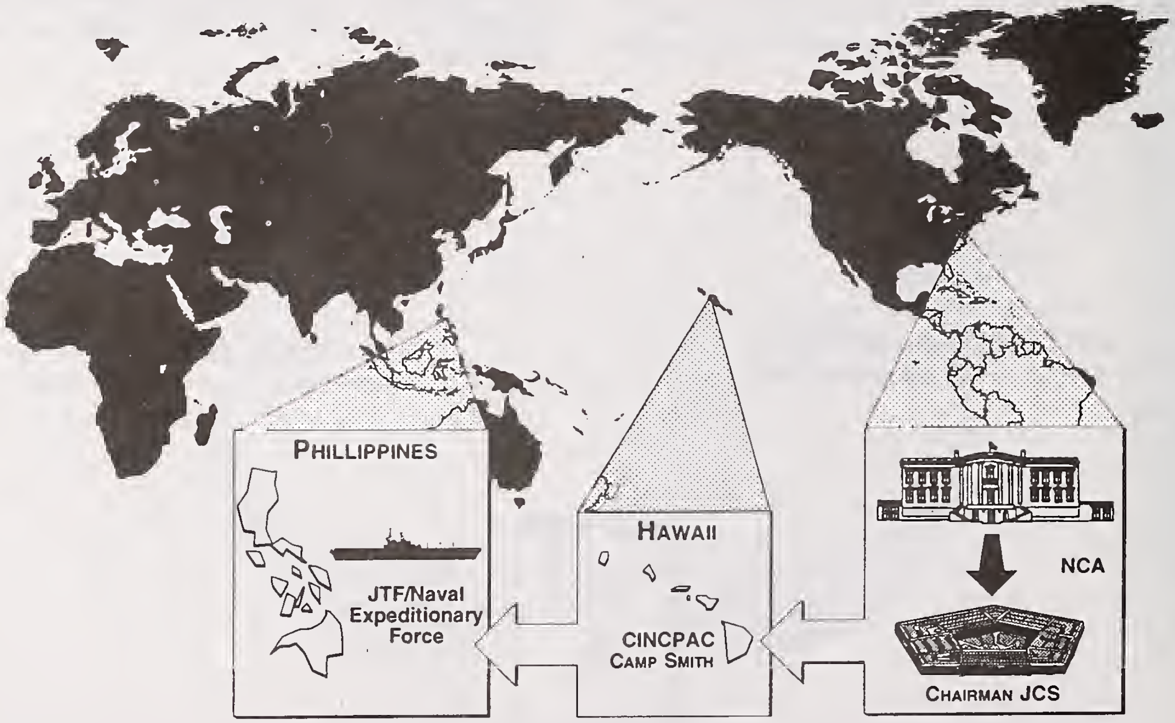

Figure 2. Example of Links of Authority in an Operational Command.

Commensurate with the responsibility given a CINC to achieve unity of effort among the Services, he has also been given increased authority by law (Title 10, U.S. Code, as amended) and DOD Directive 5100.1, *Functions of the Department of Defense and Its Major Components*. Authority is also delineated in Joint Pub. 0-2, *Unified Action Armed Forces (UNAAF)*. Therefore, command authority for the strategic and operational levels of war extends from the President through, the Secretary of Defense to the commanders of unified or specified commands. The Chairman, Joint Chiefs of Staff advises the NCA and ensures the coordination and dissemination of orders. A unified or specified commander exercises Combatant Command (command authority)[5] over assigned forces.

Combatant commands are organized on a regional or functional basis. Combatant commands organized regionally are known as theater commands. Each command is assigned a regional, strategic problem that requires the coordinated efforts of two or more Services. Combatant commands organized functionally are assigned worldwide functional responsibilities and are not bound by a single area of operation.

b. Control. Essentially, the general architecture[6] of our national control infrastructure traces the lines of command authority. The national control infrastructure employs organizational structure and a support system to manage information. Organizational structure is directed by law and controlled through the administrative and operational chains of command within the DOD, its subordinate agencies, and the armed forces. The support system interfaces[7] with and supports the organizational structure. The NCA manages and processes the information requirements of the administrative and operational chains of command. The National Military Command System supports the national- through operational-level decision and execution cycle. Its objective is to provide the NCA and other national leaders with the information they require to ensure control of their forces throughout any crisis and to focus their full energies toward containing the crisis. The National Military Command System includes—

- Command facilities.
    - National Military Command Center.
    - Alternate National Military Command Center.
    - National Emergency Airborne Command Post.
    - Other command facilities designated by the Secretary of Defense or CINCs.
- Decision support systems.
    - Presidential systems.
    - Other federal agency systems.
    - Joint Operations Planning and Execution System.
- Global information processing and exchange systems.
    - Defense Communications System.
    - Worldwide Military Command and Control System.

Command facilities are redundant in order to maintain continuity of command under any condition (war and peace). These facilities are located, designed, and staffed to process information critical to the commander's decisionmaking process.

The Joint Operation Planning and Execution System (JOPES) is the decision support system used to support the command and control information needs of senior-level decisionmakers directing joint planning and operations. It interfaces with the Presidential system and other federal agency systems. The Joint Operation Planning and Execution System is a computer, software-based system designed to aid in the monitoring, planning, and executing of joint mobilization, deployment, employment, and sustainment activities. Complex operations are translated into assigned tasks and time-phased plans to facilitate the rapid and orderly movement of forces and resources into and out of theaters of war. The Joint Operation Planning and Execution System concentrates on threat identification and assessment, strategy determination, course of action development, execution planning, and implementation.

Command center facilities and decision support systems require a constant flow of information from global information processing and exchange systems. The Worldwide Military Command and Control System (WWMCCS) is the military's global information processing and exchange system that moves information between command center facilities and decision support systems. The Worldwide Military Command and Control System supports five basic functions:

- Collects information to support informational requirements (warning, attack assessment, joint operations planning and execution).
- Transports information (efficient movement of information to the point of need to facilitate command functions, hold conferences).
- Processes information (facilities that can act as primary or alternate command centers with systems that report, display, assess, and provide executive aids to support planning and decision cycles).
- Disseminates information (warning, notification, issue of orders, or coordination of operations).
- Protects information (passive and active systems and procedures that deny unauthorized access to sensitive information).

The Worldwide Military Command and Control System is a global, interactive computer network that provides a multipath channel of secure communications to transmit tactical warning and intelligence information to the NCA and then transmit direction from the NCA to Combatant Commanders. This global, computer network ensures the NCA a means of communicating and coordinating with the—

- White House Situation Room and other facilities used by the NCA.
- Joint Chiefs of Staff.
- Service Headquarters.
- Unified and specified combatant commands.
- Service component commands.
- DOD agencies.
    - Defense Information Systems Agency.
    - National Security Agency.
    - Defense Logistics Agency.
    - Defense Intelligence Agency.
    - Defense Mapping Agency.
    - Defense Nuclear Agency.

In addition, it coordinates with the following non-DOD activities to exchange military, political, intelligence, diplomatic, and economic information:

- State Department.
- Central Intelligence Agency.
- United States Coast Guard.
- Federal Emergency Management Agency.
- United Nations Military Mission.

Structurally, the Worldwide Military Command and Control System combines with the National Military Command and Control System to interrelate and coordinate activities internal and external to the DOD. The Chairman, Joint Chiefs of Staff coordinates all National Military Command System activities outside the DOD.

Typically, military communications and information systems requirements exceed the capability of the Worldwide Military Command and Control System, especially during wartime operations, and commercial information carriers are required to augment communications and information processing. For this reason, the Director of the Defense Information Systems Agency manages the National Communications System and supports the National Military Command and Control System. The Defense Information Systems Agency provides operational management and technical direction of global information systems that support strategic through operational levels and is capable of interfacing with tactical-level systems. The National Communications System coordinates the use of commercial information systems resources to support federal agencies, the DOD, and combatant commands.

The Navy and Marine Corps operate in this global command and control environment and must link into the national-level decision and execution cycle if they are to employ military power and execute their mission. The Navy command and control system provides the strategic-to-operational infrastructure required by Navy and Marine forces while afloat and during operational maneuver from the sea. At the operational and tactical levels, the Navy command and control system provides the flexibility needed to anticipate the commander's needs and meet the requirements dictated by a three-dimensional naval environment (air/space, surface, subsurface). The Navy command and control system employs a highly flexible command and control support system involving a global network of shore-based communications stations, space-based resources, and fleet operations centers. The Navy command and control system also supports the Defense Communications System by extending control from the NCA into all theaters of operations.

Marine Corps command and control is an integral part of Navy command and control afloat (see fig. 3). Once ashore, the Marine command and control system continues to be supported by the Navy command and control system. The Marine command and control system also interfaces with joint operational- and strategic-level command and control support networks in order to support operations ashore. These command and control support systems (C^2 support systems) are capable of providing a responsive, flexible Navy-Marine Corps command and control infrastructure that can move rapidly and function anywhere in the world.

1004. Command and Control Theory

Joint Pub. 1-02 defines command and control as "*the exercise of authority and direction by a properly designated commander over assigned forces in the accomplishment of the mission. Command and*

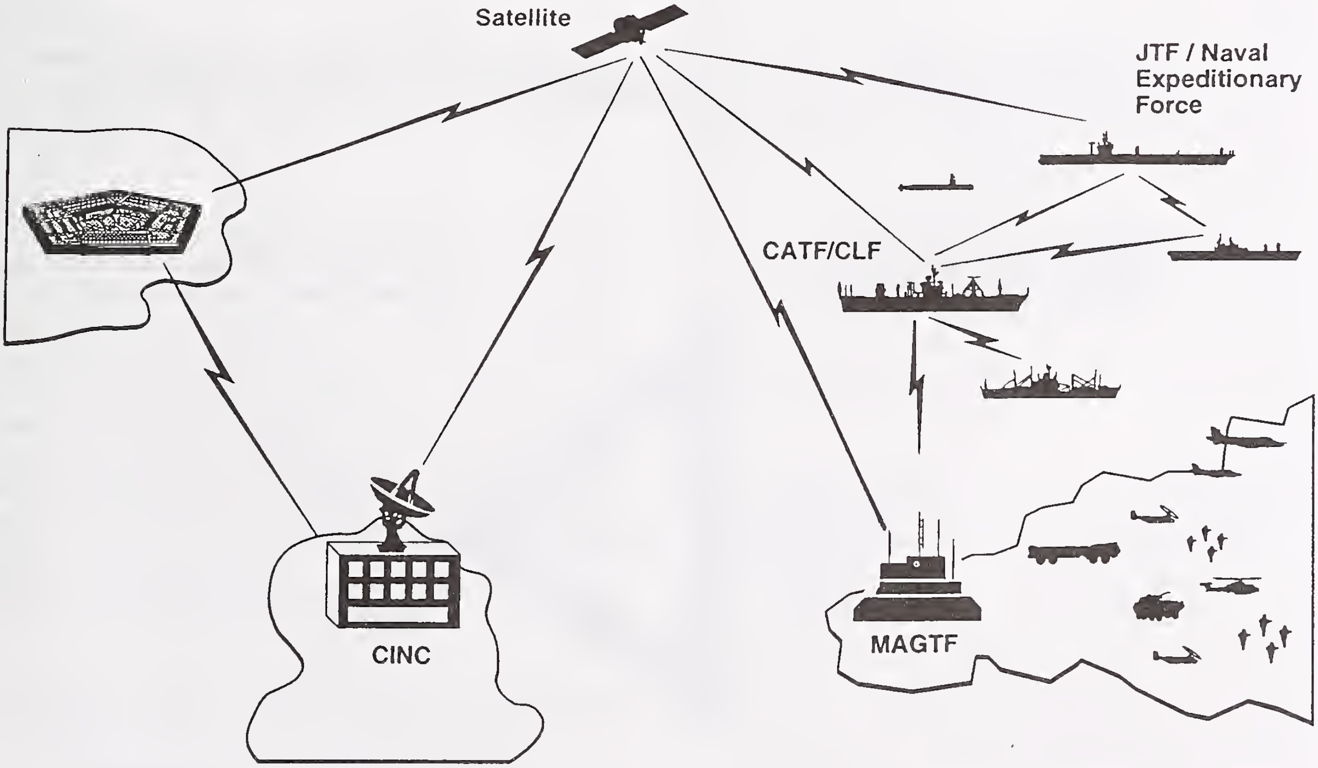

Figure 3. The MAGTF in a Global Command and Control Environment.

control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission."[8] This definition provides a concise description of the command and control mission and the resources required to implement command and control. However, it is not intended to provide the details of how it is implemented. An understanding of command and control must be built around a central theory of how command is actually linked to control.

Command and control is a process that is extended through a system. This process uses information to coordinate people and things toward a common mission objective. It involves a continuous, dynamic interaction among people, information, and a technical C^2 support system to form an infrastructure that effectively moves and processes information. The commander uses information to communicate decisions and extend his influence over the MAGTF and the enemy. Information becomes the principal link to control execution because it drives the organization of people, equipment, and resources, as well as the architecture of the technical C^2 support system (see fig. 4).

To defeat the enemy, the MAGTF's decision and execution cycle must be consistently faster than the enemy's. We must operate within the enemy's decision cycle in order to manipulate or deny the enemy access to his command and control and to slow his decision and execution cycle.

Therefore, the ultimate objective of command and control is to achieve unity of effort and increase the tempo of operations. Unity of effort integrates all aspects of the MAGTF and yields the MAGTF's full range of capability. Increasing the speed of the decision cycle creates tempo. Unity of effort and tempo integrate maneuver, firepower, and sustainment in order to generate the decisive combat power required by our maneuver warfare doctrine. Both principles demand the insight, vision, focus, and direction of a single commander to—

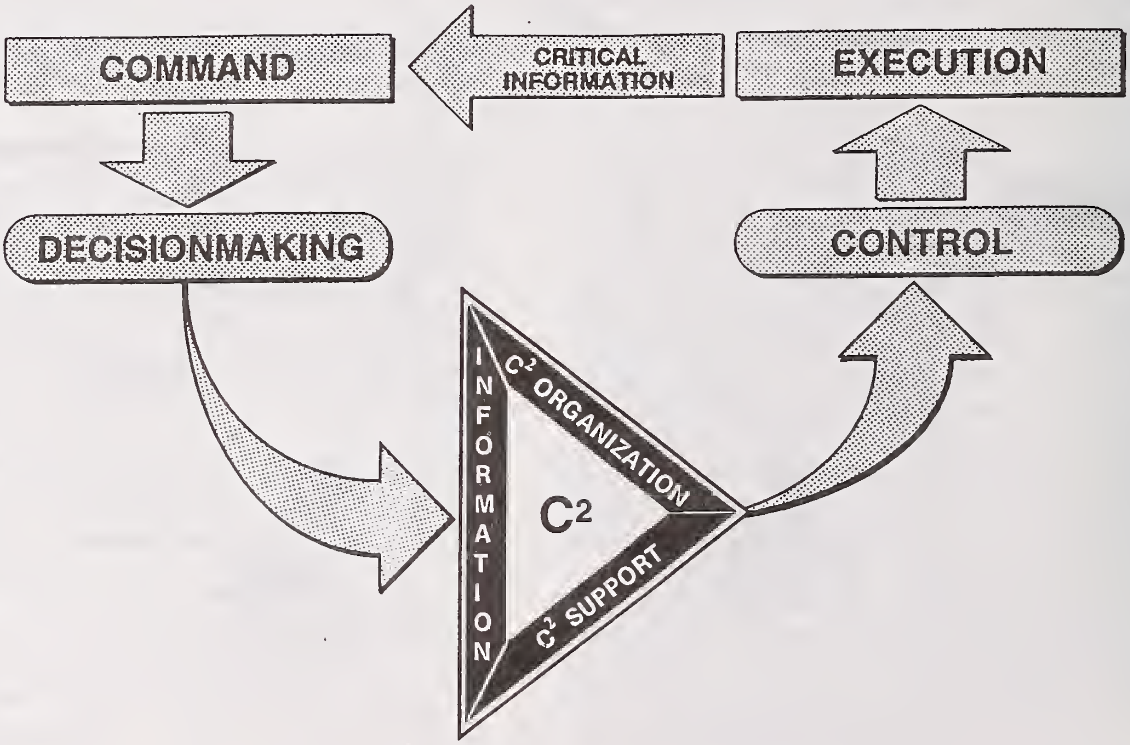

Figure 4. Command and Control Theory Links Decisions to Execution.

- Clearly define **success** in the form of "commander's intent."
- Establish **implicit communications** between all levels of command based on mutual understanding and anticipation of each commander's actions.
- Foster **motivation** through leadership and long-term working relationships.
- Use an **established, common knowledge base** of doctrine, tactics, techniques, and procedures to build competence.
- **Standardize** equipment, facilities, and operating standards for simplicity, interoperability, and flexibility.
- Focus command and control by placing **decisive information** at the right place and time to gain operational and tactical advantage.

1005. Command and Control for Maneuver Warfare

> *"Maneuver warfare . . . seeks to shatter the enemy's cohesion through a series of rapid, violent, and unexpected actions which create a turbulent and rapidly deteriorating situation with which he cannot cope."*[9]

Maneuver warfare, applied to operational maneuver from the sea or sustained operations ashore, implements the basic principles of tactical mobility, operational speed, and flexibility at extended distances. Increased operational complexity, compressed factors of time and space, and rapidly changing situations drive the commander's decision cycle. An increased tempo of operations requires shorter decision cycles and the need to decentralize the command structure (directive style). A slower, more deliberate operation may rely on a more centralized command structure (detailed style). Most commanders create a balance between the two styles.

Maneuver warfare relies primarily on **directive** control:

- Commanders lead with a loose rein.
- Command and control is decentralized, flexible, and dynamic.
- Orders and plans are brief and their execution relies on the judgment and initiative of subordinate commanders.

Perhaps the most famous and widely studied example of directive control is described by Douglas Freeman in his account of the Chancellorsville meeting between Generals Lee and Jackson. "*What do you propose to make this movement with?*" asked Lee. When Jackson replied that he wanted to commit his entire corps, he signalled his intent to destroy the Union army and drive Hooker back across the river—an audacious, decisive movement. "*What will you leave me?*" Lee asked Jackson. Jackson's response identified only the divisions of Anderson and McLaws. This would leave Lee and his 14,000 remaining troops squarely between Hooker's 65,000 and Sedgwick's 40,000 men. "*Lee considered all this, then met Jackson's eyes. "Well,"* he said, "*go on.*" "[10]

Directive control causes information to flow rapidly up and down the chain of command only to unify effort; most information is passed laterally to ensure coordination and speed of action within the MAGTF. **The commander who is confident in the competence and abilities of his subordinates willingly accepts a reduced level of certainty in favor of immediate action.** The commander determines which tasks he must personally supervise during the execution of his orders and the priority of each task. Control is implemented through deputy MAGTF commanders and staff. Reconnaissance generally pulls the MAGTF (RECON PULL) and allows it to exploit enemy weaknesses quickly in order to shatter his morale and physical cohesion.

In counterpoint, the philosophy of firepower and attrition relies primarily on **detailed** control:

- Commanders lead with a tight rein.
- Command and control is centralized, inflexible, and methodical.
- Orders and plans are detailed and their execution does not require decisions by subordinate commanders.

Typically, information flows up and down the chain of command to maintain control. The level of certainty with regard to the enemy is higher. The commander pushes (COMMAND PUSH) his decisions forward to the MAGTF and ultimately to the enemy in a specific, preplanned manner to achieve a certain physical effect.

In contrast to Lee's performance at Chancellorsville is General McClellan's failure at Antietam. McClellan's command and control did not identify and exploit numerous opportunities to crush the rebellion's principal army immediately before and during the battle of Antietam. Stephen W. Sears attributes the uncoordinated and piecemeal attacks of four separate corps to McClellan's detailed control and almost total absence of command. McClellan's lack of coordination was only exceeded by his failure to provide mutual support. McClellan's "tight rein" and his denial of freedom of action to his subordinate commanders may have been the genesis of a Union soldier's complaint in a letter home: "*It seems that we can't get no Generals to suit us. They all seem to work against one another. I hope they will all unite and have it settled as soon as possible for I am getting tired of it.*"[11]

The choice of style is determined by the commander and influenced by the situation. However, Marine Corps warfighting doctrine emphasizes maneuver over firepower and attrition. **A directive style of control becomes critical during the execution of naval power projection and dominates the MAGTF commander's execution of operational maneuver from the sea and MAGTF operations ashore.**

Maneuver warfare further demands that the MAGTF train to operate under decentralized command and control. The commander's flexibility to centralize or decentralize decisionmaking is critical during rapidly changing situations. If decisionmaking is decentralized, subordinate commanders must be delegated the proper authority and required command and control resources. The commander executes control by designating **critical** information requirements needed to support his decisions. This then drives his subordinate commanders and the organization of his staff and C^2 support system to form a widely dispersed and shared network that controls the processing and flow of information. Information moves up, down, and laterally within the chain of command to promote a shared picture of the battlespace between the commander and his subordinates. This common view of the battlespace and the ability to access critical information allows the commander and his subordinates to "see" the battlespace together as a team. Once the commander clearly understands and implements this concept of command and control, he can exploit the full potential of MAGTF firepower, maneuver, and sustainment.

1006. Command and Control in Combined-Arms Strategy

"Combined arms is the full integration of arms in such a way that in order to counteract one, the enemy must make himself more vulnerable to another. We pose the enemy not just with a problem, but with a dilemma—a no-win situation."[12] When command and control is used to integrate firepower, mobility, and sustainment, it becomes a component of combined-arms strategy by providing information as a vital link to combined-arms success (see fig. 5).

Command and control, however, is a double-edged-sword. A well-balanced, focused command and control infrastructure reaps tremendous operational and tactical advantage. A poorly balanced, unfocused command and control infrastructure degrades the decision cycle. Once the MAGTF's decision cycle becomes slower than the enemy's, MAGTF command and control becomes vulnerable. It is therefore essential to attack enemy command and control while protecting friendly command and control. **Command and control warfare**[13] **is the strategy used to attack enemy command and control while protecting our command and control** (see fig. 6). It intensifies the effect of decisive action to dominate battlespace and win in combat.

Our command and control warfare strategy recognizes that the psychology of war is part of maneuver warfare. It specifically seeks the enemy commander's mind as the objective with which to manipulate or deny him access to his command and control information while protecting our command

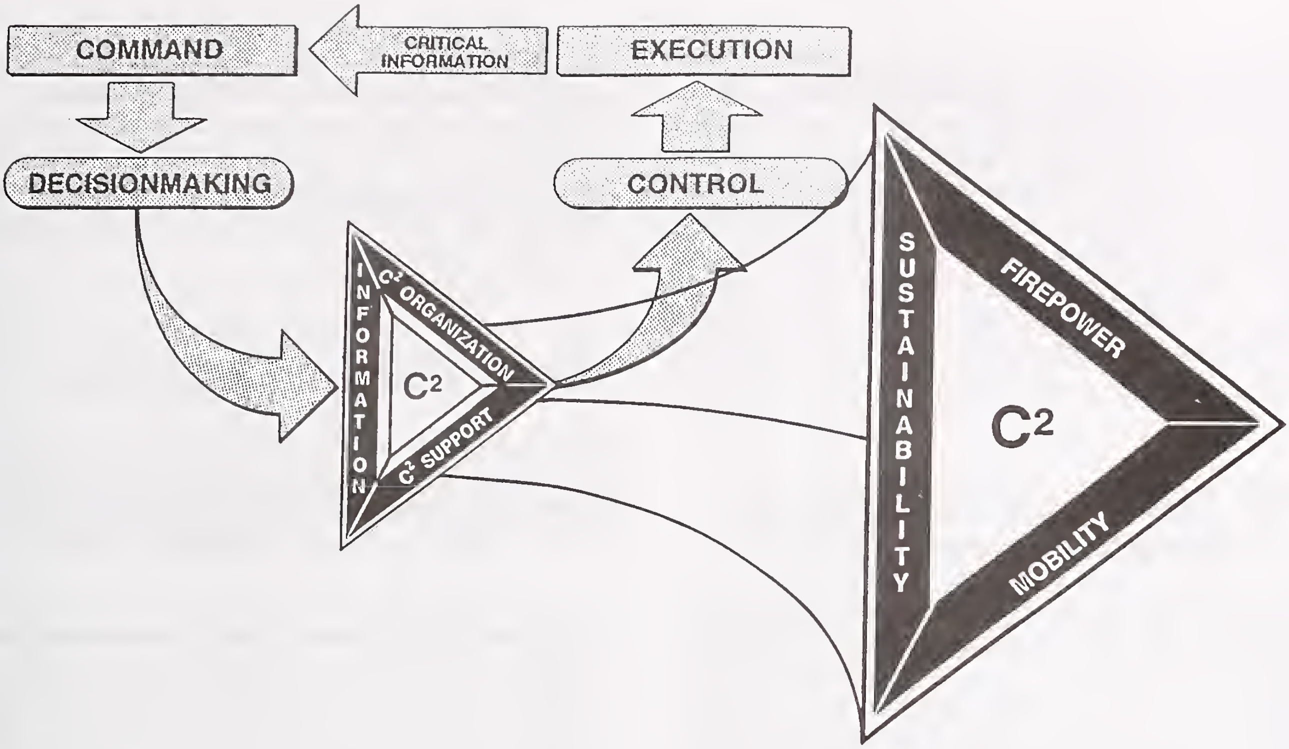

Figure 5. Command and Control: A Component of Combined-Arms Strategy.

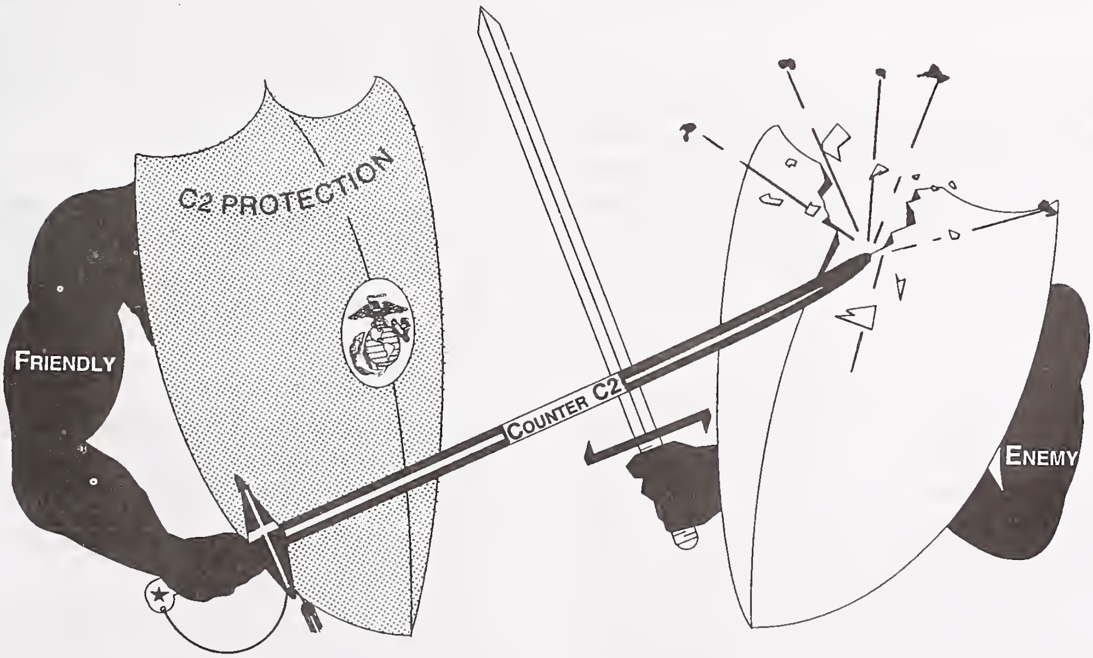

Figure 6. Command and Control Warfare Strategy.

and control. "*Positions are seldom lost because they have been destroyed, but almost invariably because the leader has decided in his own mind that the position cannot be held.*"[14] When implemented in concert with firepower and maneuver, command and control warfare becomes an integral part of the combined-arms strategy. Effective use of command and control warfare rapidly increases enemy uncertainty, magnifies the combined-arms effect, and paints a picture of defeat in the enemy commander's mind.

1007. Fundamental Command and Control Infrastructure

MAGTF command and control demands an effective infrastructure that extends the process of command and control via a chain of command. The command and control infrastructure is a complex system that collects and passes information, helps the commander evaluate information, and relays the commander's decisions. The fundamental components of a command and control infrastructure are the foundation upon which a force is organized; standard procedures are developed; equipment and facilities are designed, procured, and employed; and personnel are trained.

a. Organization. Organization includes commanders, their staffs, and supporting forces. Forces are trained and equipped with the manpower, weapons, mobility, sustainment, and associated resources to support known mission requirements. Forces are then task organized to support specific mission requirements.

b. Information. A commander uses information [15] to influence MAGTF action and enemy response. Command and control information supports the commander's decision cycle to **plan** for, **direct, control,** and **coordinate** the employment of his forces in the execution of their mission. Consequently, it is crucial that information is effectively managed and continuously coordinated to ensure unity of effort within the MAGTF and adjacent and higher operating forces.

c. C^2 Support System. An effective C^2 support system consists of a network of people, equipment, facilities, and operating procedures that collect, transport, process, disseminate, and protect essential information. It also supports command and control warfare functions that counter enemy command and control.

1008. An Effective Infrastructure

The central purpose of command and control is to implement the commander's intent in pursuit of the mission. A successful command and control infrastructure must be viewed as one system and—

a. Facilitate Commander's Influence of Events. No coherent campaign or battle plan is possible without the commander's vision of how he intends to win. The commander's command and control organization and C^2 support system, imbued by his intent, provide the means to apply his decisions effectively, gather and analyze information, implement his plan, and supervise his forces.

b. Adapt to the Situation. The commander must be free to move and to lead from any point in the battlespace. Therefore, the commander's C^2 support system must have the flexibility to adapt to his needs rapidly.

c. Support Information Requirements. The commander's C^2 support system must provide a reliable, secure, fast, and durable information network that allows him to implement his operational concepts.

d. Exploit MAGTF Capabilities. If the commander is to exploit MAGTF capabilities effectively, his C^2 support system must—

- Support the MAGTF during all types of deployment/employment.
- Enable the MAGTF to maintain its mobility throughout a fluid and rapidly moving battlespace.

- Survive the enemy's weapons systems and command and control warfare while continuing to provide essential command and control support to the MAGTF.
- Sustain the MAGTF during long- or short-term operations.
- Provide flexibility to task organize as required.
- Interface with other C² support systems (e.g., NCA, joint/combined forces, and other military and federal agencies).

1009. The Crucial Focus of Command and Control

The vital role of command and control is clear: it tightly integrates and unifies the MAGTF. Command is a process that demands continuous, clear thinking and problem solving under the most demanding conditions. The commander's mind is the focus of Marine command and control. Through the extension of control, the commander's influence becomes the focus of the total command and control infrastructure and forms the fundamental conduit of command authority. The commander must have information that is relevant, essential, timely, and easily understood if he is to balance and focus his command organization and C² support system resources toward his mission objectives.

> *"Improving all aspects of C² is the key to fighting smarter. Having belatedly come to recognize this fact, we can't afford to ignore it just because defense budgets shrink. Improved C² will continue to be the basis for doing more with less."*[16]

Chapter 2

Organization for Command and Control

2001. Command

To command [1] his forces effectively, the commander must view command from two major perspectives. First, command must support the MAGTF by providing everything it needs to prepare for, survive, and fight during combat. Second, command must enable the MAGTF to carry out its mission.

Command is a uniquely human dimension of war. The human element of command brings a tremendous potential for bold, decisive, and creative actions that can adapt to rapidly changing situations. However, the human element also can bring potentially paralyzing limitations; for example,

> William Manchester states that Napoleon lost at Waterloo because, on the morning of battle, he was catatonic. Douglas S. Freeman notes that at the Battle of Brandywine, Washington was "in a daze." Ernest B. Furgurson quotes criticisms of Hooker at Chancellorsville in 1863: "*. . . so well known to possess personal bravery;* . . . [he] *seems to have yielded entirely to his nerves and to have shown a complete want of backbone at the wrong moment* [and,] *when a general has done his very best and is defeated fairly and squarely, he is entitled to a nervous collapse. But when a man breaks down absolutely before the battle has even begun . . .*" Hooker, like Bonaparte and Washington, was unable to issue orders or even to understand the reports brought to him. The explanation is simple—information overload. The brain, like a computer, becomes ineffective if it receives too much data. [2]

A common understanding of warfighting principles gives the commander a unified way to—

- Orient to the battle rapidly.
- Evaluate the situation.
- Estimate and anticipate the course of events.
- Determine what is critical.
- Measure risk.
- Take decisive action.

Marine Corps doctrine, tactics, techniques, and procedures provide a structured, common base of professional knowledge that unifies the way Marine commanders view the MAGTF. This knowledge is further enhanced by Marine Corps training, education, and experience to develop the skills and instincts required for the commander to extend his influence during combat. Therefore, the commander is the core of any command and control infrastructure and the foundation from which the MAGTF plans and directs its actions.

The nature of MAGTF command is complex. Organizational structure provides the commander with a way to reduce complexity into manageable portions and unify the force. **Delegating specific levels of authority and responsibility throughout the chain of command enables freedom of action at the point of decision while maintaining a mechanism for control.** Formal and informal information flows from top to bottom, bottom to top, and laterally to unify the effort and allows the MAGTF to react quickly to an ever-changing situation.

a. Principles of Command. To make things happen, the force requires a clear understanding of the mission. They must also know who leads, who follows, and the available resources. The commander is responsible for the accomplishment of assigned tasks and missions and unit performance. With responsibility goes the authority to direct forces and take actions that ensure success. Command authority is the basis through which control is extended. There are six principles of command that support command authority: unity of command, span of control, chain of command, delegation of authority, continuity of command, and freedom of action.

(1) Unity of Command. To achieve unity of command, a force must operate under the insight, vision, focus, and direction of a single commander vested with the authority to plan and direct operations.

(2) Span of Control. Span of control includes the number of subordinates, number of activities, and area of operations that are practical for one person to command. There is a limit to how much an individual can personally direct and still remain effective.

(3) Chain of Command. A chain of command is the succession of commanding officers, superior to subordinate, through which the authority of command is extended and exercised. The commander at each level responds to orders and direction received from a higher authority and, in turn, issues orders and direction to his subordinates. Bypassing a level of command is justified by only the most exceptional circumstances. If the chain of command is bypassed, it must be reestablished as quickly as possible and the bypassed commander advised of the action taken.

(4) Delegation of Authority. The commander may delegate all or any part of his authority. Delegation of authority and assignment of responsibility for functions or tasks does not relieve the commander of his ultimate responsibility. However, it is a tool that can be used to focus command and staff effort effectively and distribute tasks between the immediate staff and subordinate commands to ensure unity of effort. Focusing and balancing authority and responsibility are the keys to effective command and speed of action, and they demand careful consideration.

(5) Continuity of Command. Continuity of command must be maintained at all times. To ensure continuous command authority, the commander establishes a clear procedure for succession of command in the event that he is unable to exercise command personally or during transfers of command authority from one location to another.

(6) Freedom of Action. Freedom of action is the core of the Marine Corps' mission-oriented philosophy of decentralized command and control. Once the mission and commander's intent are established and the necessary orders issued, subordinate commanders are empowered to make decisions based on their initiative and understanding of the commander's intent. Decentralized command and control does not diminish command responsibility. Focus and unity of effort are retained through the commander's intent and his monitoring of events.

b. The MAGTF Commander. To conduct a coherent campaign or develop an effective battle plan, the commander must construct a vision of how he intends to win—commander's intent. The MAGTF commander must accurately determine the enemy's critical vulnerability and the general conditions that will shape the battle and expose enemy weaknesses. Decisive application of combat power hinges on the commander's ability to visualize the objective continuously, conceptualize the battlespace, and make rapid decisions that shape the battle.

Decisions alone do not win campaigns or battles. The commander's influence must permeate the battlespace and encompass both the MAGTF and the enemy. The commander uses information, organization, and a C^2 support system [3] to influence mission execution. **It is the commander's influence over the execution of his decisions that determines his success.**

(1) Commander's Intent. The commander's intent is a clear, concise statement that defines success for the force as a whole by establishing, in advance of events, the battle or campaign's desired end state. Commander's intent contains—

- The purpose of the operation.
- The critical vulnerabilities and centers of gravity for both enemy and friendly forces.
- A vision of how the operation will be conducted in a broad scope. (Description of proposed phases is optional.)
- A description of the end state with respect to the relationship of the force, the enemy, and the terrain.
- A description of how the end state will facilitate future operations.

Clearly stating the commander's intent may be the most difficult, yet one of the most important, contributions made by the commander. Once the commander's intent is established and disseminated, it stimulates the entire planning process, unifies the force toward a common mission objective, and provides subordinate commanders with a way to gauge freedom of action.

(2) Commander's Concept of Operations. The commander's concept of operations is a bold, clear, simple description of how the MAGTF will achieve the intended results. It provides general direction for all subordinate unit operations and extends the commander's intent throughout the entire force. Each subordinate commander develops his concept of operations in consonance with the MAGTF commander's. The concept of operations is built around a scheme of operational and tactical maneuver, fire support, and sustainment that takes full advantage of the MAGTF's flexible combined-arms team and available joint/combined resources. The concept of operations becomes the basis for task organization, scheme of maneuver, tasks assigned to subordinates, terrain organization, synchronization, and identification of critical collateral operations.

(3) Commander's Influence. If the commander is to achieve his goal, he must influence the MAGTF and its area of responsibility. The commander projects his influence through specific, deliberate actions—

(a) Focusing the Mission. The commander's decisions maintain the MAGTF's focus on its mission and ability to react quickly. To maintain the focus, the commander must concentrate on future events and decision points that will shape the battle. Decisions must be clear, concise, and executable.

(b) Delegating Command Authority. Delegating specific command authority to effect control reduces the commander's involvement in the staff process and current situation. By delegating specific command authority, the commander is free to concentrate on the future direction of the force.

(c) Designating Critical Information Requirements. By designating critical information requirements [4], the commander provides subordinate commanders with a way to focus and task-organize the command and control organization and C^2 support system. An effective command and control organization and C^2 support system influence the flow and processing of information and ultimately controls execution.

(d) Employing Personal Presence. The size and scope of modern warfare have made it impossible for the commander to physically observe the entire battlespace, but the requirement remains. Today, the commander uses reports and other combat information systems as a way to monitor the battle. The commander must be where he can effectively "see" the battlespace and concentrate combat power at the point of decision. He must position himself where he can demonstrate his leadership through the example of his presence. His willingness to share danger and the sacrifices of war builds trust and confidence among subordinates.

> *A commander should command from well forward. This allows him to see and sense firsthand the ebb and flow of combat, to gain an intuitive appreciation for the situation which he cannot obtain from reports. It allows him to exert his personal influence at decisive points during the action. It also allows him to locate himself closer to the events*

> *that will influence the situation so that he can observe them directly and circumvent the delays and inaccuracies that result from passing information up the chain of command.* [5]

The commander's personal presence allows decisions to be made on the spot and resources to be allocated to maintain the tempo of operations. There is no clearer signal of the commander's intent than his presence with the main effort at the decisive time and place. However, the commander is not limited by his physical location. His C² support system and command and control organization extend his influence over the battle.

(e) Task Organizing. Task-organized forces are structured to support the commander's concept of operations, to enhance the overall MAGTF effort, or to support a decisive shift in the main effort.

(f) Committing Reserves. Employing reserve forces is a decisive action that influences the main effort and aids in defeat of the enemy.

(g) Reallocating Resources. The commander redirects allocated resources to take full advantage of a successful supporting attack or exploit unexpected success in another area.

c. The Staff. The commander's staff [6] advises and assists him in exercising command and implementing control. The staff also supports subordinate commanders. Staffs are organized based upon the commander's need to gather, manage, and process information. This information affects how the commander plans, directs, controls, and coordinates his forces.

The commander must describe assigned responsibilities clearly, delegate routine decisionmaking authority commensurate with a staff officer's ability, and establish an effective span of control. Staff officers are assigned functional areas of responsibility to balance the division of labor and provide a single point of contact.

Staff officers have no authority over any particular unit simply by virtue of their position. Staff officers may, however, be delegated authority by the commander. An officer can fill both a command and staff billet simultaneously if efficiency and speed of action are essential.

Staff officers carrying out basic staff functions must avoid usurping the responsibilities or authority of subordinate commanders. Staff officers from a higher headquarters provide only recommendations and advice to subordinate commanders, and the subordinate commander may accept or reject these ideas.

d. Command and Control Support Forces. In addition to his staff, the commander has a large and diverse group of highly trained and specialized command and control support forces. [7] Once task organized, these forces form the MAGTF's C² support system and facilitate the processing and flow of information throughout the MAGTF. Examples of these units include the force reconnaissance company, communications battalion, division communications company, and the Marine air control group.

2002. Control

Command authority is extended through control [8] to link decisionmaking to execution. **The commander uses control to extend his authority, and he implements control through his command and control organization and C² support system.** (See chapter 4 for a detailed discussion on the C² support system.)

Command and control organization is the foundation of control. It provides a clearly defined structure based on relationships of authority and responsibility. These relationships, both permanent and temporary, focus and balance the chain of command and form the basic tools required to task organize the force effectively. Effective command and control organization results in an interconnected hierarchy of commanders and staffs. Command and control organization combines with the C^2 support system to form a task-organized command and control infrastructure through which the commander extends control over the force.

a. Chain of Command. There are two types of chains of command through which control is effected: administrative and operational. Both the administrative and operational chains of command result from authority obtained by the commander through his normal table of organization command structure or through designation from a higher headquarters. The administrative chain of command is the "normal" table of organization. The operational chain of command is based on task-organization requirements.

b. Types of Control. There are five types of control: administrative, operational, and tactical control; coordination; and technical direction.

(1) Administrative Control. Administrative control[9] is implemented via the administrative chain of command. It involves the authority to train, equip, and ensure the required order, discipline, maintenance, and care of the force.

(2) Operational Control. Operational control[10] is implemented via the operational chain of command. Typically, it includes the forces within the commander's area of responsibility and is not based solely on the commander's table of organization.

(3) Tactical Control. Tactical control[11] is essential in the direction of local maneuvers and employment of weapons. Examples of tactical control include terminal guidance by forward air controllers to direct close air support onto a target, a direct air support center controlling air space, or forward observers controlling indirect fire.

(4) Coordination. Coordination[12] is crucial during combat. It involves clearly identified ways to coordinate and convey information (formal and informal) among commands, units, and elements. Coordination maintains unity of effort and is essential to MAGTF integration.

(5) Technical Direction. Technical direction is "the performance of a specialized or professional service, or the exercise of professional guidance or direction through the establishment of policies and procedures [relating to] technical matters."[13] It carries the direction of command authority across boundaries of command and is directive in nature. Technical direction is critical to C^2 support systems that require precise automated and human adjustments.

c. Command Relationships. The types of control form command relationships and specify the degree of authority one commander has over another commander. In fact, several commanders may exercise some degree of authority over one unit.

Command relationships are either permanent or temporary. Permanent command relationships are based on a table of organization, support the administrative chain of command, and are either organic[14] or assigned[15]. Temporary command relationships are based on the assigned task, support the operational chain of command, and are either attached[16] or detached[17]. The degree of operational control and administrative control determines the basic command relationship.

If units or personnel are assigned or attached, they are under the command of the gaining commander unless otherwise specified. The losing commander no longer has responsibility for or authority over reassigned units or personnel. The losing commander may or may not have responsibility for or authority over attached individuals.

Task-organized forces are designated as reinforced or minus. Forces with units attached are referred to as reinforced. If the placement is to be relatively permanent, the term "assigned" is used. If the placement is temporary, the term "attached" is used. Forces with units detached are referred to as minus.

Note

The term "reinforce" is also used to designate a support relationship.

d. Support Relationships Within a MAGTF. A support relationship exists when one commander supports another commander, normally at the direction of or approval of a higher mutual commander. This relationship is accomplished by directing one force (referred to as the "supporting force") to support (or operate "in support of") another force (referred to as the "supported force"). A unit placed in support of another unit is directed by the parent commander to respond directly to the supported command. Supported commanders do not exercise command over the supporting unit, nor do they assign missions to the supporting unit. The supported and supporting commanders do not have operational or administrative control over each other. Mutual coordination ensures unity of effort. Four types of support relationships exist within the MAGTF: direct support, general support, reinforcing, and general support-reinforcing.

Direct support requires a force to support another specific force and authorizes it to answer directly the supported force's request for assistance. A unit in direct support provides specific tactical or service support to another unit. The parent commander retains command of the supporting unit. Priority of support goes to the supported unit, but other missions may be undertaken if they do not interfere with support of the supported unit.

Typically, *general* support indicates that the supporting commander will support the entire force and not a specific section. The commander in general support retains command of organic assets and control of attached elements. Priority of support, if there is a conflict, is generally determined by the next higher common commander.

A *reinforcing* mission supports and augments another force. A unit reinforcing another unit receives tasks from the reinforced unit, from its own units, and finally from its own higher headquarters. A reinforcing unit's area of responsibility includes that of the reinforced unit. Priority of support goes to the supported unit, but other missions may be undertaken provided they do not interfere with support of the supported unit.

A *general support-reinforcing* mission provides support to the force as a whole, while simultaneously providing support to another like unit. Priority of support is for the force as a whole unless otherwise specified by higher headquarters.

e. Support Relationships Within Joint Forces. Support may be exercised by commanders at any echelon, but it is normally established below the level of combatant command. If the Secretary of Defense or a joint force commander assigns one force to aid, assist, protect, or sustain another force, a support relationship is established between the forces. The joint force commander identifies the degree of authority granted to the supported commander in the establishing directive. [18]

f. Liaison. No amount of technology can replace face-to-face exchange of information between commanders, especially those in higher or adjacent commands unfamiliar with MAGTF operations. Unfortunately, time constraints do not allow the commander's personal presence at every location. Through liaison [19], the commander—

- Extends his "presence" and personal judgment.
- Improves his influence.
- Improves his situational awareness of internal and external commands (e.g., joint/combined forces, federal agencies, international agencies).
- Improves unity of effort.
- Improves speed of action between forces.
- Improves interoperability.
- Prevents mistakes or misunderstandings.
- Enhances trust and cooperation.

The need for liaison increases as the pace of operations increases. Therefore, liaison should be established at the earliest opportunity. Traditionally, liaison is established from senior to subordinate, supporting to supported, reinforcing to reinforced, and left to right. The specific way that liaison is established depends on the situation and where the commander perceives a need to improve unity of effort and tempo internal or external to the MAGTF. The critical functions of liaison are to—

- Monitor.
- Coordinate.
- Advise.
- Assist.

There are no firm rules for selecting liaison personnel. However, one criteria remains constant: liaison personnel are the commander's personal representatives to another command. Therefore, the commander must trust his liaison officer's integrity and professionalism to perform and make operational and tactical decisions on his behalf, **even if the liaison officer cannot contact his commander.** The officer must be of appropriate grade to allow him to deal directly with the commander to whom he is attached. The liaison officer and any supporting personnel must be self-sufficient and have the mobility, resources, and appropriate communications commensurate with their task. Under no circumstances should liaison personnel become a burden to the receiving command.

Effective liaison must be developed long before it is needed to ensure that the liaison officer is fully prepared to carry out his duties and responsibilities and to instill trust and confidence with the supported commands. This requires that liaison officers are assigned well in advance of actual need, are provided with trained command and control support teams, and train with the commands that they may support.

Note

Liaison does not replace staff interaction and proven staff procedures.

2003. MAGTF Command and Control Organization

MAGTF organization reflects the combat-proven command and control concepts and principles that form a totally integrated combined-arms air-ground-logistics team under the vision and focus of a single commander. All MAGTFs, regardless of size, have the same fundamental structure: a command element (CE), a ground combat element (GCE), an aviation combat element (ACE), and a combat service support element (CSSE) (see fig. 7).

The command element's size and command and control support capability principally determine the MAGTF's designation as a Marine expeditionary force (MEF), Marine expeditionary brigade (MEB), Marine expeditionary unit (MEU), or a nonstandard Marine contingency force (MCF).

a. Command Element. The establishment of a single command element over the ground, aviation, and combat service support elements forms the command and control infrastructure essential to the MAGTF's mission. The commander is supported by a combined-arms staff and C^2 support system capable of strategic through tactical interface.

Command and control support of the command element is principally provided by elements of the surveillance, reconnaissance, intelligence group (SRIG). The SRIG provides strategic- and operational-level interface with global, national, joint, and combined C^2 support systems (including intelligence networks) external to the MAGTF. The SRIG also provides direct and general command and control support throughout the MAGTF and connects and extends tactical command and control between the command element and major subordinate commands.

b. Ground Combat Element. The GCE is task organized to conduct ground operations. It is constructed around an infantry unit, varying in size from a rifle platoon to a reinforced Marine division or divisions. It has organic combat support and combat service support units. Typically, there is only one GCE in a MAGTF. If more than one GCE exists, each is assigned its own mission and sectors of responsibility, and the command element's fire support coordination role is expanded.

Command and control support is provided by the division headquarters battalion, reconnaissance

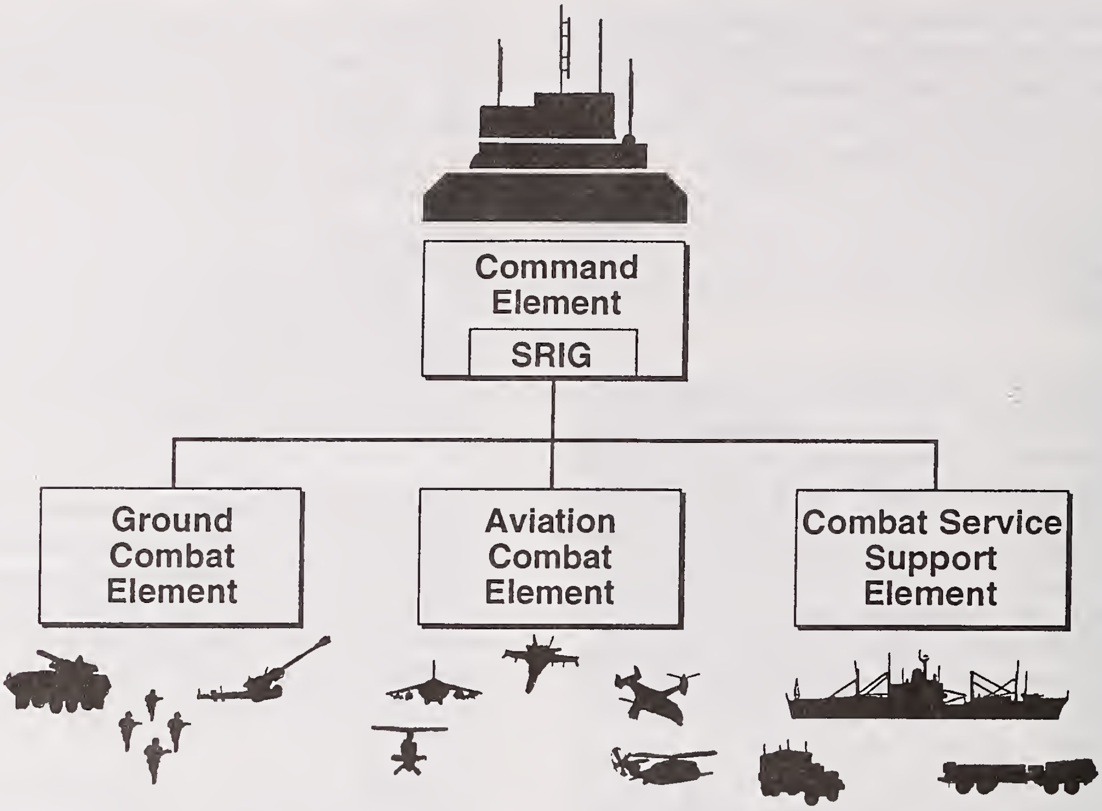

Figure 7. MAGTF Command Structure.

battalion, and headquarters companies at the regimental and battalion levels. The SRIG provides general and direct command and control support to the Marine division and/or other joint/combined maneuver elements task organized under the GCE.

c. Aviation Combat Element. The ACE is task organized to conduct air operations. It consists of an ACE commander, aviation staff, and its own command and control support. The ACE has organic aviation command, combat support, and combat service support units. There is only one ACE in a MAGTF. If required, units of the ACE can be based at diverse locations to speed response.

Command and control support is provided by the Marine air control group and other wing assets. General support from the SRIG ensures that the ACE C^2 support system integrates with all MAGTF elements and is interoperable with all joint forces and some allied forces. The ACE C^2 support system also provides general command and control support to the GCE for the integration of air assault and close air support operations.

d. Combat Service Support Element. The CSSE supports the continued readiness and sustainability of the MAGTF as a whole. The force service support group task organizes the CSSE based on the MAGTF's mission. It consists of one commander and a support staff drawn from the organic assets of one or more force service support groups. The CSSE task organizes combat service support detachments to provide direct and general logistics support functions that are not organic to the other elements.

Command and control support is provided by the force service support group's headquarters battalion. The SRIG provides general and direct command

and control support to the CSSE and other joint/combined logistics elements attached to the MAGTF. Since combat service support detachments are widely dispersed throughout the MAGTF area of operations, the CSSE's C^2 support system must interface with every MAGTF element.

e. Echelonment of Command. Command echelonment allows the MAGTF to move and fight while ensuring continuity of command. Survivability is gained by physically separating the location of each echelon. Flexibility is gained by commanding from one echelon while another echelon moves its command facilities to support the continued battle. Striking a proper balance between survivability and operations is the key to the effectiveness of each echelon (see fig. 8).

The MAGTF's combat operations centers are the facilities (e.g., buildings, structures, tents) used by the commander or his staff, at each echelon, to plan, direct, control, and coordinate operations of assigned forces. **A MAGTF combat operations center is referred to as a command post (CP)** [20], [21] **only when it is occupied by the commander.** There are three MAGTF command echelons: main, rear, and tactical.

The primary interests of the *main* echelon are directing current operations and planning future operations. The main echelon staff is organized into two sections. One staff section handles current operations while the other handles future operations. The current operations staff—

- Supervises mission execution.
- Coordinates combat operations.
- Coordinates required combat support/service support.
- Handles close and deep operations occurring within 12 to 72 hours.

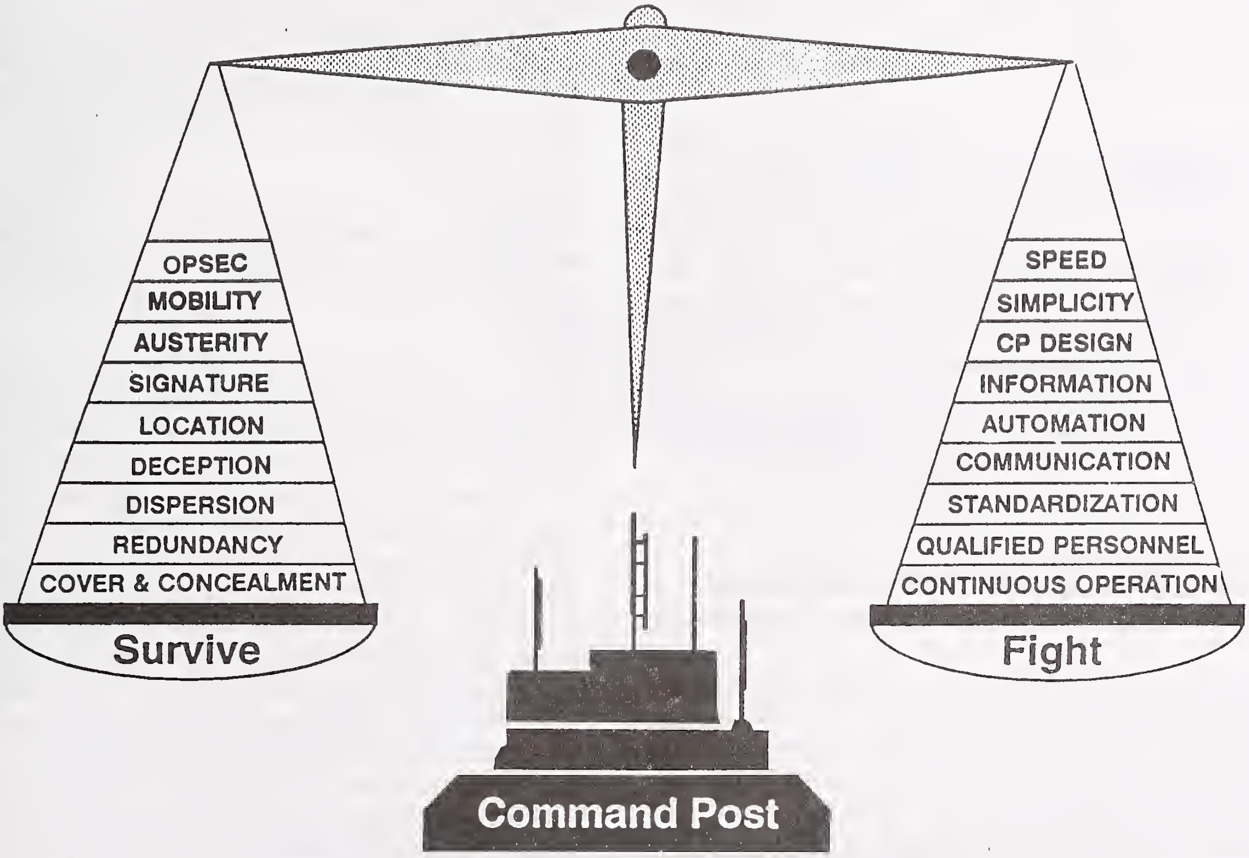

Figure 8. Factors of Command Post Effectiveness.

The future operations staff—

- Plans future close and deep operations beyond 72 hours.
- Coordinates the command and control organization and C^2 support system.
- Monitors continuity of MAGTF operations.
- Determines possible courses of friendly/enemy action/reactions.
- Develops execution plans with key decision points and alternate plans (i.e., branch).
- Ensures synchronization of operating systems in operation plans, branches, and sequels.

The *rear* echelon's primary mission is to support combat operations. It should be located where it can fulfill its primary mission and not engage in close combat. The rear echelon provides command and control of rear security operations, terrain management within the MAGTF rear area, sustainment, control of administrative moves, and other associated functions. The rear echelon can be located near major ports, airfields, or telecommunication facilities, or it can remain sea-based.

The primary purpose of the *tactical* echelon (commonly referred to as the command group) is to provide the commander with freedom of movement and the information critical to his situational awareness. Typically, the tactical echelon consists of the commander and representatives from the intelligence (G-2), operations (G-3) (including air liaison and fire support coordination element), and information systems (G-6) staff sections. The tactical echelon must have the mobility and command and control support commensurate with its purpose.

2004. Task Organization for Naval Expeditionary Force Operations

The Navy and Marine Corps's command organization is based on task organization. While the MAGTF is embarked on amphibious shipping, the MAGTF commander serves concurrently as commander of the landing force. Typical doctrinal command relationships may change based on the specific mission.[22] However, the MAGTF commander continues to direct the combat actions of his force, and he instructs his subordinate commanders to develop the landing force plan and organize the landing force. The MAGTF commander retains co-equal command status with the commander of the amphibious task force until the promulgation of the warning order, attack order, or an initiating directive that specifies command relationships. These command relationships cease upon termination of the operation as delineated in the order/initiating directive.

During an amphibious operation, the landing force may be task organized at various times in one of three functional forms: organization for embarkation, organization for landing, and basic tactical organization. Landing force elements are initially formed in the embarkation organization and remain in this organization until operational maneuver from the sea commences. Landing force elements are then reformed into landing groups (i.e., organizations for landing). Once ashore, they are reformed a third time into their basic tactical organization for combat. Marine forces that are airlifted and/or use Maritime Prepositioning Force ships follow a similar progression for embarkation, deployment, and employment into the theater of operations. However, the organization for landing is not required.

Organization for embarkation is a temporary, administrative formation of personnel, supplies, and equipment. It provides the necessary organization for movement to the objective area.

The organization for landing includes the required tactical grouping of the landing force and its subordinate echelons for the amphibious assault. It groups forces required to execute operational maneuver from the sea and to conduct initial operations ashore in accordance with the commander's concept of operations. During an amphibious assault, there is an absence of normal control and support from the next higher command echelon. Therefore, combat teams are task organized to be self-sufficient and to meet specific mission requirements until the next higher command is ashore and able to assume control. The battalion landing team, normally a reinforced infantry battalion, is the basic task organization for the ship-to-shore movement. Battalion landing teams form a regimental landing team, normally a reinforced infantry regiment, in larger amphibious operations.

The basic tactical organization is the task organization of landing force units for combat. The transition from the organization for landing to the basic tactical organization is a gradual process and occurs as the battalion landing team and regimental landing team dissolve. The commander at each echelon task organizes his forces for the attack at the earliest opportunity; however, he must not disrupt the momentum of the overall attack. Once the landing force's command organization is established and becomes the basic tactical organization, battalions and regiments are referred to as "reinforced" or "minus," not as battalion landing teams and regimental landing teams.

2005. Battlespace Organization and Control

Battlespace organization is the way naval expeditionary force commanders visualize how they are going to fight the enemy and structure their command and control to ensure victory. Battlespace is an area of operations viewed in three dimensions: air/space, surface, and subsurface (see fig. 9). **The commander relates his forces to each other in terms of sea, air, and land operations and to the enemy in terms of time.** He must know not only the location of the enemy, but how fast the MAGTF can react to the enemy's initiatives and how fast the enemy can react to the MAGTF.

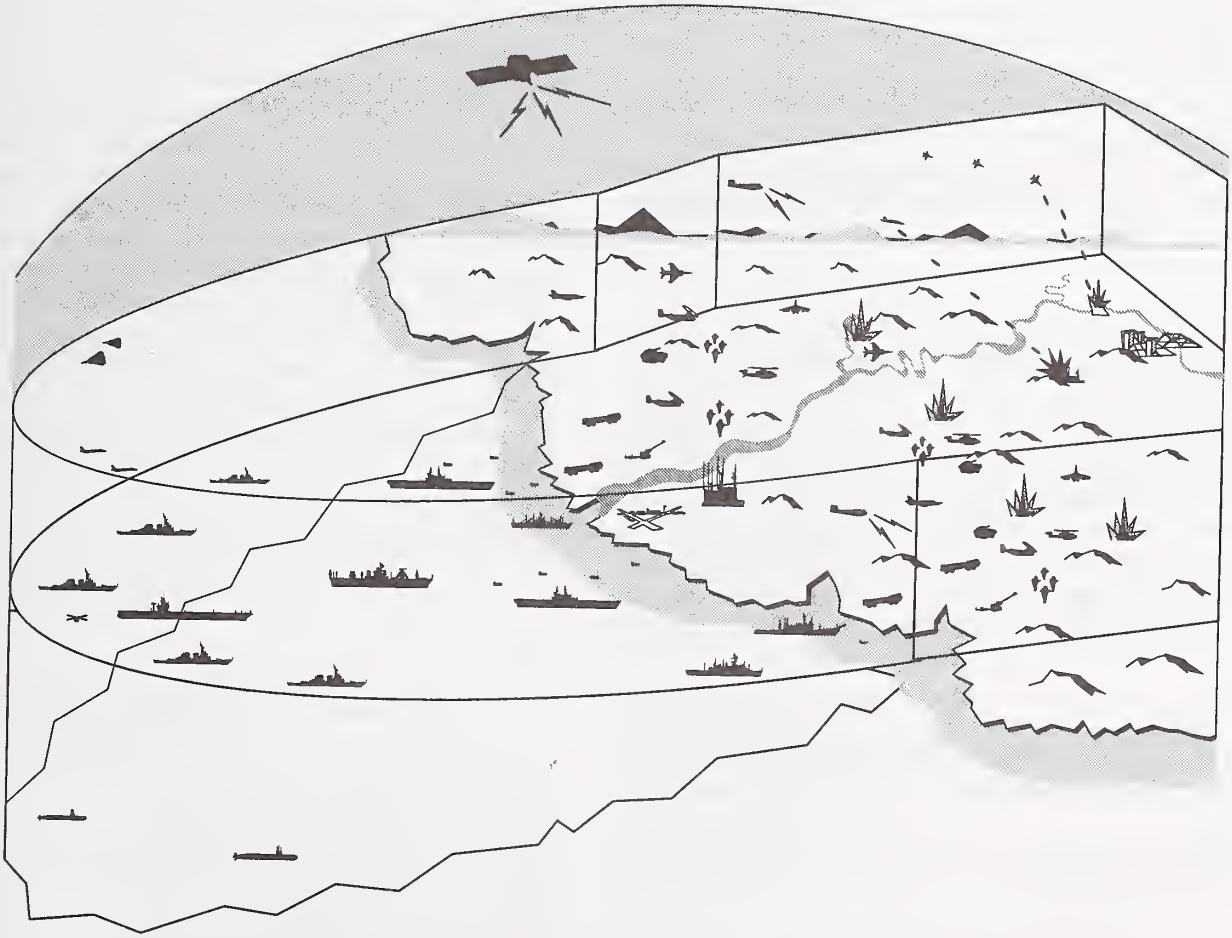

Figure 9. Naval Expeditionary Force Battlespace.

The commander's understanding of time and space relationships and systems' capabilities determines his reaction time and ability to maintain operational momentum. Once the battlespace area and time factors are determined, the commander facilitates command and control by organizing his command and control organization and C^2 support system into a framework that orders the battle, provides control measures, and integrates the MAGTF's efforts in order to achieve the desired effect on the enemy. This framework of operations is characterized as deep, close, and rear operations. Fighting within this framework requires a unified force that can conduct deep, close, and rear operations simultaneously.

Control and domination of battlespace is the heart of naval expeditionary warfare. Naval power projection is accomplished through the dominance and operational maneuver of naval expeditionary forces in the world's littoral areas. **Navy and Marine Corps combined-arms forces generate precise offensive power at the decisive time and place through massive firepower, rapid maneuver, and sustained logistical support due to their ability to exploit U.S. and coalition command and control resources (space-based and ground-based).** This is the essence of the Navy-Marine strategy, and it ensures effective transition from open ocean to littoral areas and from sea to land and back again.

Chapter 3

Command and Control Information Management

3001. Command and Control in the Information Age

Evolving technology has changed the way we apply the principles of war. Improvements in mobility, weapons, sensors, computers, and systems continue to compress factors of time and space, demand a faster tempo of operations, and generate large amounts of information. [1] **Information is the basic ingredient that bonds and focuses effort at all levels, and its importance cannot be overstated.** MAGTF command and control effectiveness rests in the commander's ability to absorb information, determine what is important, and take the appropriate action. The commander must understand and manage information, or it will overload him, degrade his reactions, degrade the reactions of his staff, and, ultimately, degrade the force. His decisionmaking process and control over mission execution depend upon a two-way flow of relevant, timely, and accurate information both vertically and horizontally throughout the MAGTF. Therefore, the commander builds his command and control organization and C^2 support system to replace information overload with action to ensure mission execution.

3002. Information and Maneuver Warfare

Information is an element of national power that influences diplomatic and political interaction among nations; this, then presents a challenge to national security. The challenge is to fight the war of ideas in order to maintain the political and economic infrastructure of world democracies. The creative use of global information media can aid in achieving national objectives in all phases of conflict. The NCA uses information to seek political impact in communicating intent during deterrence or to provide for strategic deception, all of which achieve national policy objectives and greatly influence maneuver warfare as well as other military operations.

Maneuver warfare and combined-arms strategy include the use of information to psychologically impact the enemy commander. The commander applies command and control warfare to exploit information in order to attain associated national- through tactical-level command and control warfare objectives and to get inside the enemy commander's decision cycle.

3003. Information Management Theory

Uncertainty is a reality of war that is fueled by information overload. **The commander must avoid information overload and focus on information that will convey his influence over his forces and the enemy.** Orders must be clear, concise, and in a form that Marines will quickly understand. The commander uses information management to place **critical** information at the right place, at the right time, and in a form that influences appropriate action. Information management is based on principles that govern the quality and flow of information. These principles form the foundation that supports information management within command and control organization and the employment of command and control support forces.

a. Information Management Principles. Information must support its intended user, and its quality and flow determine command and control effectiveness. Quality information enhances the reactions of Marines and their equipment by reducing confusion and ambiguous information. Effective flow moves information from top to bottom to unify the focus of the force, from the bottom to top to monitor execution, and laterally among adjacent forces to maintain unity of effort.

(1) Information Quality. Quality information must be—

(a) Timely. Information must be available at the right place and time. Procedures, preplanned information flow, timely decisions, and automated systems are essential if information is to arrive at the point of need within the required time.

(b) Accurate. Information must be correct and convey the actual situation. Automated systems collect, transport, and process information with high accuracy, but without judgment. To improve the accuracy of information, Marines are trained when and how to interject sound judgment into the automated systems' functions and products.

(c) Complete. Commander's critical information requirements are crucial to focus the command and control organization and C^2 support system on what is important, to understand "how much is good enough," and resist overburdening the command and control system.

(d) Objective. Information should be unbiased, undistorted, and free from influence or constraint.

(e) Usable. The method of display must be understood by and support the user. The display must use commonly understood terms, symbols, and any other applicable, standardized formats.

(f) Relevant. Information must apply to the mission, task, or situation of the people or machines receiving it.

(2) Information Flow. Information must be—

(a) Positioned Properly. The MAGTF's need for specific types of information is largely predictable. Therefore, locating the required information at its anticipated point of need prior to demand speeds the flow of information and reduces demands on communications.

(b) Mobile. The reliable and secure flow of information must be commensurate with the MAGTF's mobility and tempo of operations. Information flow must immediately adjust to support the vertical and lateral flow of information between adjacent forces.

(c) Accessible. All levels of command must be able to pull the information they need to support concurrent or parallel planning and mission execution. If possible, information is channeled to the required user via automated means in order to reduce the need for manual exchange.

(d) Fused. Information is received from many sources, in many different mediums, and formatted differently. Fusion is the logical blending of information from multiple sources into an accurate, concise, and complete summary. Fusion's goal is to reduce information to the minimum essentials, put it in a form that Marines can quickly act on, and produce a common situational awareness that is accurate and meets the needs of the commander and subordinate leaders. Properly fused and displayed information, at the right time and place, aids the commander in overcoming uncertainty.

b. Overcoming Uncertainty and Information Overload. The desire to achieve certainty in battle haunts the commander as he seeks to reduce the risk of failure due to insufficient information (see fig. 10). Two factors govern the level of uncertainty: mission complexity and the amount of information required for certainty. As mission complexity increases, the information required for certainty rapidly increases. Historically, a commander's desire to achieve certainty has been a race between the demand for information and the ability of the

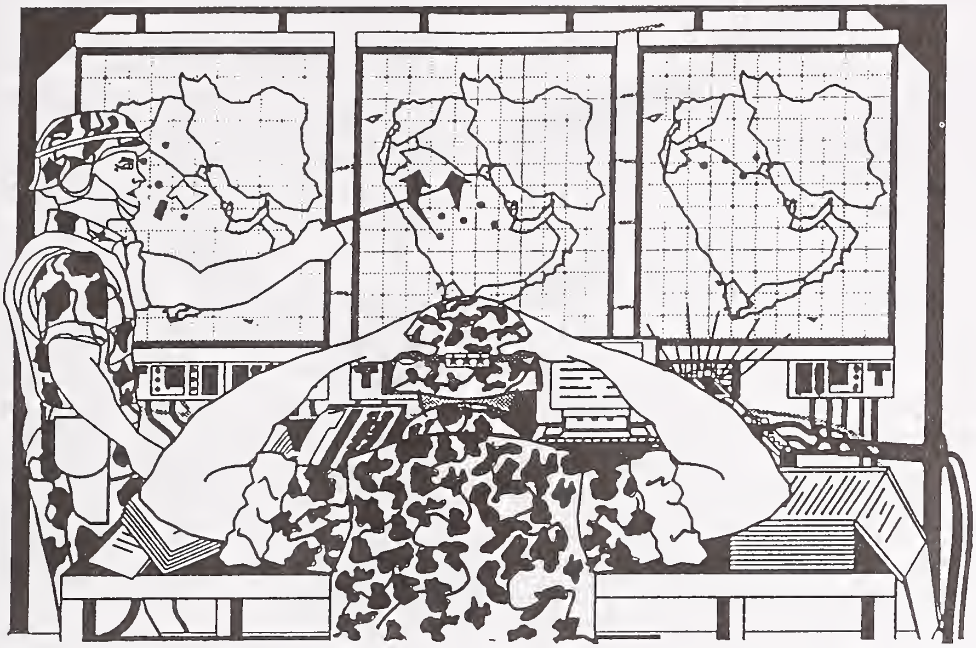

Figure 10. Information Overload.

command and control system to meet the demand. [2] As Clausewitz said, *"a great part of the information obtained in war is contradictory, a still greater part is false, and by far the greatest part is uncertain."* [3] If the commander and his staff had all the required information available at a given moment in battle, the fog and friction of war would still cast doubt on its accuracy, and its volume would likely exceed the human ability to react.

Realistically, only a fraction of the information available during combat can be collected, transported, and processed by a C² support system in a timely manner. The collection and processing of information to achieve certainty takes time—time that could be devoted to action. Therefore, the principal objective is to operate effectively and thrive in an environment of uncertainty.

Much of the commander's uncertainty is reduced through professional knowledge, training, experience, and operating standards. Enemy uncertainty will be equal to if not greater than ours. The commander does not have to seek information he knows or assumes through measured risk. Therefore, he reduces his demand for information to critical information. [4] Critical information is the essential tool used by the commander to prepare the battlespace and forms the linchpins of success in war. It identifies friendly and enemy critical vulnerabilities, influences decisions, prompts decisive action, creates enemy vulnerabilities, and ultimately brings about swift victory or averts disaster.

To ensure the quality and flow of information, the commander channels limited resources toward the information requirements critical to the MAGTF's success. These requirements are called—commander's critical information requirements. **Their primary purpose is to avoid the generation of irrelevant information and avoid information overload.** The number of commander's critical information requirements must be minimized to employ limited command and control resources effectively. For example, combat situational information consists of three major types of information: enemy, friendly, and operating environment. The more specific the information type, the tighter the focus, the more effective the C² support system is in providing quality information (see fig. 11).

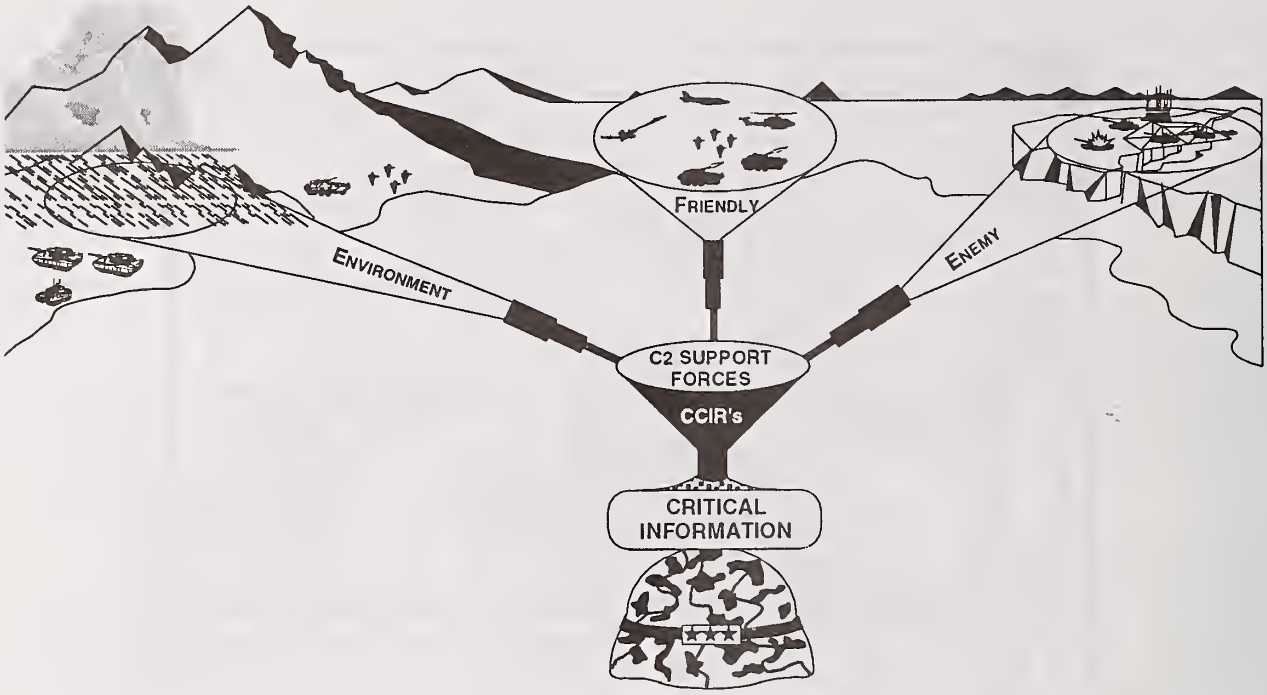

Figure 11. Focusing the C² Support System on Critical Information.

An example of commander's critical information requirements could be—

- Friendly situation and location. What is the status of our forces?
- Enemy situation and location. What is the enemy doing?
- Enemy critical vulnerability. How can I hurt the enemy the most?
- Our vulnerabilities. How can the enemy hurt me the most?
- Time. How long will it take us to . . . ? How long will it take the enemy to . . . ?
- Future. What will the situation be in . . . hours? . . . days?
- Current situation. What is my most important action now?

Appendix A provides a list of potential commander's critical information requirements. The commander and his staff continually evaluate the usefulness and importance of commander's critical information requirements and modify them as necessary. Changes to commander's critical information requirements impact the staff, the C² support system, and the decision and execution cycle.

3004. Information's Impact on the Decision Cycle

Decisionmaking is the crucial contribution of the commander to command and control. It is a time-competitive process that depends on the quality and flow of critical information. During a decision cycle, the commander—

- **Monitors** execution by collecting and using critical information on friendly/enemy forces and the operating environment.
- **"Senses"** the situation through personal observation and/or collected information.
- **Processes** the information by correlating it with what he knows or learns from external sources.
- **Compares** the current situation to the desired end state or mission objective and identifies possible courses of action.
- **Decides** on a course of action based on manual or automated decision aids.
- **Implements** the decision by disseminating information to convey orders.

Information dictates the need for decisions and generates additional information that conveys ideas in order to direct forces. Decisions are based on an anticipation of events and are influenced by many intangible factors (e.g., personal situation; character; or a "gut" feeling based on professional knowledge, experience, and measured risks). Decisionmaking can be viewed as a continuum bounded by a perfect decision at one end and a workable decision at the other.

A perfect decision requires a strict, analytical style of decisionmaking. The staff gathers all available information and methodically reviews every aspect of a mission in exacting detail. It is a time-consuming process wherein multiple courses of action are carefully developed. The commander evaluates each course of action in order to determine the perfect decision. Risk is low because the commander has reviewed every possible alternative and has achieved near certainty.

A workable decision is at the opposite end of the continuum. It requires a strict, recognition-primed [5] style of decisionmaking. The staff gathers and reviews only critical information. It is a very quick process wherein the commander depends on his knowledge, experience, and instincts ("gut" feeling) to recognize patterns in the unfolding situation. Assumptions and their associated risks are quickly formed and improved with critical information. The first workable decision is used; however, it may not be the perfect decision. Risk is increased because the commander is dealing with an increased level of uncertainty. For example, Field Marshal Montgomery used a detailed style of control and General Patton used a directive style of control during the Sicilian campaign. Each required very different styles of decisionmaking. This example illustrates the wide range of styles that can exist within the same operating environment.

Neither the perfect or the first workable decisionmaking style can be applied entirely by itself. Decisionmaking occurs between the two extremes. The primary difference between the two extremes is time and risk. An analytical (perfect) style may be appropriate for a complex situation if time permits and accuracy is essential. A recognition-primed (workable) style may be appropriate in a fast-moving situation that demands the commander make good, not optimum, decisions quickly in order to maintain a high tempo of operations; i.e., maneuver warfare.

Maneuver warfare demands that the commander and subordinate commanders make good decisions based on skill and instinct. Decisions occur quickly in order to maintain a high tempo, and time-consuming staff procedures are bypassed to the maximum extent possible. To implement a directive style of control, the commander delegates authority by pushing decision thresholds down to deputy commanders and to commanders of subordinate forces. **Therefore, directive control is essential to maneuver warfare, and maneuver warfare further demands that subordinate commanders understand and apply recognition-primed decisionmaking.** The commander ensures that his subordinate commanders routinely train to operate in an environment of uncertainty and learn recognition-primed decisionmaking. The result is a MAGTF that is capable of shortened decision cycles and a higher tempo of operations.

3005. Focusing Information for Mission Execution

Information is focused to support mission execution during four phases: planning, directing, controlling, coordinating. After receipt of the mission or initiating directive, the planning phase begins. During this phase, information is collected, processed, displayed, and assessed. The commander uses his judgment to develop his vision and choose the best course of action. The directing phase begins by developing, issuing, and disseminating the warning order to the force. Execution planning commences in parallel between the MAGTF staff and supporting commanders and staffs throughout the force. This phase ends when the operation order is issued. The controlling phase begins with the dissemination of the operation order. The commander balances the apportionment of command and control resources in order to monitor and control the execution of the operation order. The coordinating phase continues throughout all phases of the command and control process and applies to higher, adjacent, and subordinate commands. Effective coordination provides situational awareness and synchronization [6] to ensure unity of effort.

a. Planning Phase. The key to any plan is a clearly defined vision and objective. Planning must implement the commander's vision and lay the foundation for future decisions and tasks. Planning begins with the receipt of a formal mission or the commander's understanding of an implied task based on informal communications from higher headquarters. Essential information that supports the mission is gathered and a thorough analysis is performed to determine an appropriate course of action. Once the commander determines the appropriate course of action, he clearly defines the MAGTF's objectives.

(1) Mission Receipt. The MAGTF's assigned mission is usually articulated in an initiating directive or tasks received from a higher Navy, joint, or combined force headquarters. The MAGTF's mission and how it is to be executed is implied in an understanding of intent from higher headquarters.

By monitoring areas of possible interest, the commander can anticipate and prepare his staff for a potential mission. Once the mission is received, the staff has already completed much of the preliminary work and has established information and communications throughout the force. An example would be General Patton's anticipation of the relief of Bastogne that was successfully executed by his Third Army because his staff and forces were ready once the mission was received.

(2) Information Exchange. To plan effectively, the commander and his staff must have current information concerning friendly and enemy forces and the operating environment. The commander and his staff must ensure collection agencies are tasked to collect specific information in a timely fashion. This begins the process of effectively positioning information both within the staff and throughout the command to enhance the capability of the command to anticipate action. The commander and his staff request only information that will support the development of the commander's critical elements of information (see app. A). If information cannot be received in time for planning, the commander must rely on assumptions and experience until he receives current information.

(3) Mission Analysis. The commander makes his most critical contribution to the battle or campaign during mission analysis. During mission analysis, the commander assesses the total situation, builds his vision of the battlespace, and projects the desired outcome of the battle or campaign. Mission analysis is conducted by the commander and all members of the staff. A thorough mission analysis identifies the following:

- Higher commander's intent.
- Specified tasks.
- Implied tasks.
- Limitations (constraints and restraints).
- Critical vulnerability (What will make the enemy unwilling or unable to fight? What is critical to the MAGTF's success?).
- Center of gravity.

Two key products flow out of mission analyses: a restatement of the mission and the initial statement of commander's intent (see commander's influence, page 15). Both are included in the commander's planning guidance.

A time study is developed upon completion of mission analysis. A time study is essential to the commander and his staff. It schedules events and manages time during the development and issuance of the order. **The MAGTF staff should use only one third of the available time to plan.** The remaining two thirds of the time is allocated to subordinate commands. Upon completion of mission analysis, the commander's general guidance is issued in the form of a warning order to alert the force of an imminent mission. The time available, as determined by the time study, drives the form and the content of the order issued. The decision to issue and prepare a written order, an overlay/fragmentary order, or a matrix order is based on the time available.

(4) Course of Action Development. Based on the commander's general guidance, the staff develops proposed courses of action and estimates of supportability. The advantages and disadvantages of each course of action are identified, and a proposed course of action is recommended to the commander.

A proposed course of action is recorded in the form of a brief, concise statement and corresponding tactical diagram. Together, they convey the purpose of the operation, the main effort, objective(s), allocation of forces, axis of attack, major subordinate commands' and maneuver elements' areas of operations, engagement areas, and the mechanism to defeat the enemy. As the operation plan is developed, alternative courses of action are reserved for possible use as branch plans if the main course of action is unsuccessful.

The commander and his staff analyze each course of action. The analysis compares the course of action (based on time, space, and logistics factors) to the mission, enemy, terrain, weather, troops, and fire support available. The courses of action are wargamed using the enemy situation predicted by the intelligence preparation of the battlefield. Critical decision points are identified based on key events that support synchronization and mission execution. **Identification of decision points provides flexibility and allows the commander and the force to adapt to rapidly changing events.** Based on actual events during execution, the commander uses a decision point to choose to continue with the original plan or to initiate a branch plan to exploit unforeseen success.

b. Directing Phase. The directing phase begins with the commander's decision and the promulgation of a warning order that contains his concept of operations and intent. This allows major subordinate elements to begin detailed planning in parallel with the MAGTF staff. This is also the beginning of the essential synchronization that will produce unity of effort during the battle.

(1) Decision and Publication. The commander has determined a course of action based on the analysis and comparison of proposed courses of action. His decision may be to adopt the recommended course of action, adopt it with minor changes, adopt another course of action, or develop a new course of action. The approved course of action evolves into the concept of operations that forms the basis for synchronization that continues through all phases of the command and control information management process.

(2) Preparing the Operation Order. The staff prepares the necessary plans and orders based on the commander's decision. The operation order forms a logical framework for the common core of information that is germane to a specific operation. The operation order contains information that is not found in standardized doctrine and standing operating procedures. It does not repeat existing or understood information. The operation order is the central tool that builds unity of effort throughout the force. In a time-critical situation, an operation order may be given orally and then followed by a written fragmentary order or operation order.

(3) Plan and Order Approval. Once approved by the commander, the operation order is a translation of his decision. Those in each echelon of command, down to the lowest subordinate unit, develop their concepts of operations in consonance with the commander's. This provides unity of purpose throughout the force. Dialogue between the commander and his subordinate commanders occurs to ensure synchronization of effort.

c. Controlling Phase. Control includes the activities through which the commander influences execution. Deputy MAGTF commanders and the staff ensure the implementation of control (see commander's influence, page 15).

The staff continually monitors and adjusts battlespace control measures (e.g., boundaries, phase lines, fire support coordination measures, coordinating instructions, functional area restrictions, standing operating procedures, standing orders, rules of engagement) as the situation evolves. The MAGTF uses these measures only to the extent required to shape the battle and maintain unity of effort. The goal is to maximize the initiative of the major subordinate elements.

d. Coordinating Phase. The MAGTF does not operate in isolation. External command and control interface is the key to cooperation and unity of effort between the MAGTF and joint/combined forces, unified command headquarters, and U.S. naval forces. **The coordination phase is not the final phase, but it occurs concurrently with all other phases of mission execution.**

If the commander and his staff are to coordinate MAGTF operations with other Services, they must understand joint organizations, doctrine, and procedures. As discussed in chapter 2, liaison personnel provide the most visible means of exchanging both formal and informal information and are essential to the coordination process. Coordination documents (i.e., execution and synchronization matrices) speed coordination, help maintain common situational awareness, and maintain the momentum of the force.

3006. Task Organization to Support Information Requirements

Task organization provides the essential structure of the command and control organization and the C² support system. The objective of task organization is to balance the division of labor between people and automated systems so that the processing and flow of information is managed effectively. **The commander task organizes his deputy commanders, staff, and C² support system to control mission execution.**

Deputy commanders use their delegated command authority to ensure execution of the commander's intent. For example, the commander may assign a deputy to command the force during his absence, or multiple deputies can be assigned specific command functions to improve speed of action (e.g., the primary command functions of mission operations and support). Deputies assigned to a specific command function may also task organize portions of the staff to further streamline and concentrate effort. For example, a deputy assigned cognizance over the operations function task organizes the intelligence staff, operations staff, communications and information systems staff under his cognizance to streamline the C² support system. If speed of action must be further increased, the deputy may merge staff authority and command responsibility together in the task organization.

The staff's task organization is based on the commander's critical information requirements. For example, if the commander's critical information requirements reveal reduced or increased emphasis in one or more areas of staff cognizance, task organization would shift appropriately. If speed of action is essential, one officer could have both command responsibility and staff authority. The MAGTF commander and/or designated deputy commander employs the chief of staff to organize and facilitate the effective employment of the staff. In some cases the chief of staff also may be delegated authority as a deputy commander.

The C² support system's task organization is based on the need to process and move information in support of commander's critical information requirements. Command and control support forces are generally task organized to provide direct support to information processing at nodal points (e.g., command posts) and to provide general support of information flow in the MAGTF network.

3007. Information in Joint and Combined Operations

Joint and combined operations are complex and bring together diverse military organizations to operate as one force. Differences in language, terminology, doctrine, and operating standards can cause confusion, especially when interfacing diverse command and control systems. Confusion increases the demand for information, which can increase uncertainty. The lower the echelon of interface between diverse commands, the higher the uncertainty. **The MAGTF commander must ensure that great care is taken in determining command and control organization to avoid unnecessary confusion within friendly forces.** His actions can substantially reduce information overload and confusion prior to an operation. As the role of the MAGTF commander varies (e.g., commander, joint task force; component commander; warfighting commander), so does his information exchange requirements. Joint and combined operations require the most complex of all military C^2 support systems based on their degree of interoperability.

a. Joint and Combined Command and Control Organization. The MAGTF commander assigned as a commander of a joint task force, and/or participating in joint or combined operations at the operational level, should observe the following principles to ensure the force is employed to its best advantage.

(1) Establish an Effective Command Structure. The MAGTF commander establishes a command structure that clearly defines overall command responsibility and specific command responsibility for each phase of a campaign or operation. Once the command structure is established, the commander gives subordinate commanders the requisite authority to discharge their responsibilities.

(2) Select Forces Based on Capability. The MAGTF commander's selection of joint and combined forces to be employed must be based on the unique capabilities of each force (e.g., utility, required skills, expertise, combat readiness, functions)—not on equity. The MAGTF commander should select forces based on utility and not try to satisfy the individual Services' desires to participate equally in the campaign. If a single-Service force is all that is required to accomplish the mission, only that force should be employed. Other detachments or elements of a Service or force that would disrupt the operational integrity of the force should be avoided. This ensures simplicity and unity of effort.

(3) Delegate Authority to the Point of Action. Commanders on the scene must have the authority to make rapid decisions in a fluid situation in order to accomplish the MAGTF's mission and protect their commands. In these circumstances, the need to consult with higher authorities stifles operational speed and action and burdens the C^2 support system with unnecessary information. The MAGTF commander may delegate authority to a deputy MAGTF commander at the point of action to improve the MAGTF commander's span of control.

(4) Apply Decisive Force. Joint and combined forces, containing a wide array of military capabilities, should be directed toward decisive objectives so that maximum force is applied at decisive points and times. It is the decisive application of military force that allows the commander to seize and retain the initiative.

(5) Train as We Will Fight. The complexity of joint operations demands joint training and rehearsal of operational plans.

(6) Integrate Operations Within Campaigns. The principal means of integrating the array of operational and logistical capabilities is to assign strategic and operational objectives to subordinates and to establish command relationships, by phase, throughout the campaign.

(7) Interface Command and Control. The MAGTF commander ensures that command and control is interoperable through the use of standardized techniques, procedures, and control measures to communications and information systems. Information exchange must include approved joint and combined terminology and be free of Service-unique terms and phrases.

Effective command and control interface in joint and combined operations demands the use of liaison teams. Liaison teams do not replace the formal chain of command or proper staff action; however, their importance as a source of both formal and informal information exchange cannot be overstated. **The informal information exchange created by liaison acts as a lubricant to ease the difficulties of command and control interface among joint and combined forces.**

The MAGTF commander must be prepared to provide representation to joint agencies such as the joint targeting coordination board and the joint forces air component commander.[7] These agencies provide support to the components, and the commander must ensure that his representation and interface with them is adequate and effective.

b. Information Exchange Requirements. The MAGTF commander's command and control organization and C² support system must accommodate information exchange requirements. This applies regardless of the commander's title and associated responsibilities (e.g., commander, joint task force; component commander within a joint task force; commander of the landing force in a naval expeditionary force).

Formal and informal information exchange requirements shift and expand if the MAGTF commander has the added responsibilities of joint command. Formal exchange linking command authority to higher and subordinate echelons increases. Informal exchange crucial to coordination from national to tactical levels expands.

(1) Commander, Joint Task Force. The principal information exchange requirements for a joint task force commander are as follows:[8]

(a) Higher Authorities. Formal exchange is with the combatant commander who directed the establishment of the joint task force. Informal exchange may occur with the Chairman, Joint Chiefs of Staff and the NCA. Coordination with Service headquarters, functional CINCs (e.g., Transportation Command, Space Command), and national sources is essential, especially in coordinating movement and sourcing of forces and resources.

(b) Lateral Coordination. Lateral coordination with other joint and/or coalition forces is required if missions overlap or enable each other in any way.

(c) Subordinate Forces. Formal exchange is with service components participating with special operations forces, logistics forces, and/or coalition forces.

(d) Considerations. The following considerations apply:

- Adjacent coalition forces will require liaison support.
- Coalition forces under the operational or tactical control of the joint task force may require significant augmentation by C² support system resources.
- Command and control support resources from the SRIG can support a joint task force headquarters. However, if augmentation is required or requested, it must be requested through the combatant commander and coordinated through the Joint Chiefs of Staff.

(2) Marine Forces Component Commander. The principal information exchange requirements for a component commander are as follows:

(a) Higher Authorities. As a component within a joint task force, formal exchange is with the joint task force commander. Informal exchange may occur with the theater CINC. Coordination with Fleet Marine Force Headquarters, Headquarters Marine Corps, and Marine Corps administrative and logistics support activities is essential.

(b) Lateral Coordination. Lateral coordination is with Service components, special operations forces, and joint logistics command.

(c) Subordinate Forces. Formal exchange is with the MAGTF command element.

(d) Considerations. The following considerations apply:

- While the theater/joint operations area is maturing, the Marine Forces (MARFOR) component commander may be required to bypass the joint forces commander and interface with theater sources. Once the theater has matured, the joint forces commander provides the interface with theater sources.
- The MARFOR component commander establishes lateral liaison as required.

(3) Commander, Landing Force. The principal information exchange requirements for the commander of a landing force in a naval expeditionary force are as follows:

(a) Higher Authorities. Formal exchange is with the naval expeditionary force commander while the MAGTF is afloat and with the commander of the amphibious task force during operational maneuver from the sea. Informal exchange may be with the theater CINC, joint forces commander, or other components participating in associated operations ashore. Coordination with Fleet Marine Force Headquarters and Marine Corps administrative and logistics support activities is essential.

(b) Lateral Coordination. Lateral coordination is with Navy composite warfare commanders operating within the naval expeditionary force during planning and afloat phases of operations and with the amphibious task force commander during planning.

(c) Subordinate Forces. Formal exchange is with major subordinate elements within the MAGTF.

(d) Considerations. The following considerations apply:

- Naval special operating forces are assigned to the commander of the amphibious task force during amphibious operations.
- Lateral coordination with composite warfare commanders becomes informal upon execution of amphibious operations.
- The commander of the landing force and the commander of the amphibious task force are coequal until embarkation of the landing force on amphibious shipping. Then, the commander of the landing force becomes subordinate to the commander of the amphibious task force.

c. C^2 Support System. The establishment of an interoperable C^2 support system is a prerequisite in joint operations. Satellite communications is essential to support the vast distances and required operational interfaces with reliable networks to support both the vertical and horizontal flow of information. These and many other highly technical systems and resources are essential to support the efficient flow and processing of information. However, the demand for information always exceeds the available support resources. It is therefore crucial to focus information requirements to determine the need and priority for C^2 support systems. The following considerations are essential to enable command and control during joint operations:

(1) Space-Based Support. Operational-level command and control support depends on space-based support. Communications and surveillance resources are critical to operational interface with distant command posts and maneuver forces. Imagery products are essential to the intelligence cycle, target acquisition, and detection of mines. Navigation and positioning systems are essential to maneuver, precision-guided munitions, and precision timing for communications systems. However, they are shared national assets, and the priority of their use is determined by the Joint Chiefs of Staff and/or the NCA. Early identification of requirements is essential and may require the commander's personal attention to gain access.

(2) National Sources Support. Intelligence and other specialized informational support by national agencies offer critical operational-level access directly into critical information. However, they are also shared national assets that must be requested as early as possible.

(3) Operational-Level Communications. Tactical communications equipment used for operational-level interface is monitored by the Joint Chiefs of Staff to assist joint decisionmakers in the allocation of tactical communications resources (e.g., specialized equipment of the Marine communications battalion, Army signal brigade, Joint Communications Support Element). The Defense Communications System's interface points, located in each theater around the globe, are controlled by the Joint Chiefs of Staff through the Defense Information Systems Agency. Memorandums of understanding exist to augment and expand support requirements upon approval from the Joint Chiefs of Staff or CINC.

(4) Frequency Spectrum Management. The allocation and management of frequency spectrum for friendly use and deconfliction with electronic warfare operations is a crucial task. The joint communications-electronics operating instructions are essential to all communications in the joint area of operations and those extending out of theater.

Chapter 4

Enabling Command and Control

4001. The C² Support System

The commander enables command through his C² support system and its supporting subsystems. **The C² support system is the final part of the triangle that permits command and control information and organization to be transformed into a complete operating system.** Command and control support forces perform information-related functions. Similar to the employment of combined arms, these forces are task organized and employed by the commander to control the processing and flow of information and facilitate his decision and execution cycle (see fig. 12).

The C² support system reflects the way the commander perceives the implementation of command and control. **The commander uses the C² support system to link decisionmaking to mission execution based on the Marine Corps' command and control theory.** The C² support system provides the commander with a way to view command and control as a whole, to identify weaknesses and strengths, and to use limited command and control resources effectively. The C² support system has two critical purposes—

- It forms the means to blend firepower, maneuver, and command and control resources to exploit the full range of MAGTF capabilities, including the generation and decisive application of combat power.
- It forms the basis upon which to evaluate and determine the actions required to build and maintain effective command and control.

The C² support system provides the means through which the commander moves and processes information to facilitate his decision and execution cycle. Its principal objectives are to enhance unity of effort, compensate for human limitations by balancing people and systems, and create a common situational awareness throughout the MAGTF. Obtaining these objectives enables the C² support system to achieve its purpose.

a. Enhance Unity of Effort. The C² support system makes possible the dialog between the commander and his subordinate commanders. The C² support system extends the commander's influence and allows him to receive feedback on mission execution. It allows the impressions and expertise of multiple commanders to be combined quickly in order to solve problems and laterally coordinate the execution of missions and tasks.

b. Balance People and Systems. The C² support system balances the ability of people and automated systems to deal with large amounts of information while avoiding information overload. People provide judgment, and computers provide the rapid retrieval and manipulation of information. Balancing the division of labor between staff and automated systems and properly focusing command responsibility and staff authority determine the quality of information.

c. Create a Common Situational Awareness. Maneuver warfare demands that the C² support system create a common situational awareness throughout the battlespace by rapidly sharing information among the commander, his staff, key decisionmakers, and supporting forces. The C² support system controls the processing and flow of information and integrates all-source, multimedia, and multiformat information into an

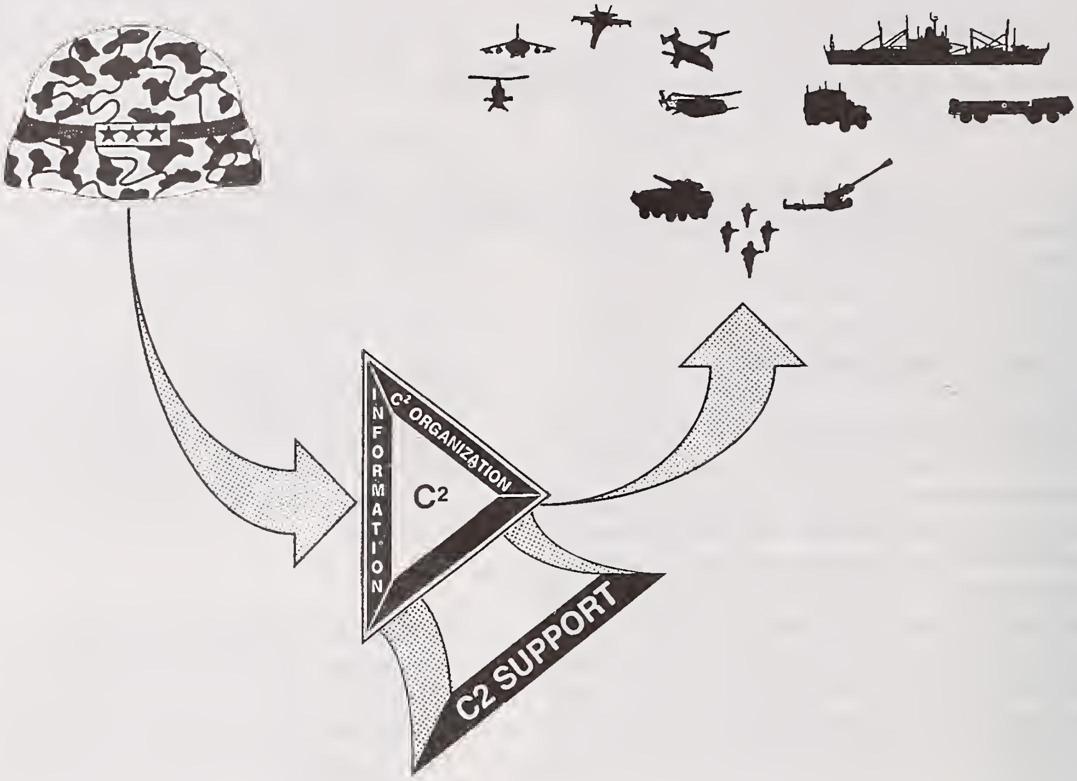

Figure 12. Command and Control Support Links Commander to Forces.

accurate, complete summary. Decisionmakers then have access to the information required to maintain situational awareness. **The commander's ability to access, on demand, only the information critical to his area of operations allows him to avoid information overload and increases his ability to react.**

4002. C² Support System Components

The MAGTF's C² support system is a concept-based system that uses five subsystems to effect command and control: command and control facilities, decision support, information exchange, surveillance, and control of command and control support forces. These subsystems can be fully automated, semiautomated, manual, or a combination.

a. Command and Control Facilities. Command and control facilities are the combat nerve centers of the commander, his staff, and other supporting activities throughout the MAGTF. Command and control facilities support the commander's decisionmaking process and control of mission execution at all levels. They are generally located near command and control nodes. Examples of command and control facilities range from combat operation centers and control centers that support decisionmakers to surveillance and reconnaissance facilities that collect and process information. Command and control facilities support the processing of information in six command and control functional areas at each echelon of command within the MAGTF:

- Maneuver (e.g., combat operations centers).
- Fire support (e.g., fire support coordination centers, fire direction centers).
- Intelligence (e.g., MAGTF all-source fusion center).
- Air operations (e.g., tactical air command center, direct air support center, or combat operations center).

- Combat service support (e.g., combat service support operations center).
- Command and control warfare (e.g., used in a combat operations center).

Note

These six command and control functional areas appear in all combat operations centers at each echelon within the MAGTF. Other command and control facilities support one or more functional areas based on the facilities' purpose.

It is the task organization and employment of command and control support forces that enable the six command and control functional areas. **The task of command and control support forces is to process and move information in support of the decision and execution cycle at each level of the MAGTF.** They control, plan, coordinate, and sustain all command and control support subsystems.

b. Decision Support. Decision support is a function that processes, fuses, and tailors information to assist decisionmaking. It integrates and shares information both internal and external to the MAGTF to provide a shared "picture" of the battlespace. Decision support integrates information from the six command and control functional areas and tailors decision support to the specific user's needs.

(1) Maneuver. Maneuver is the executive layer of decision support that pulls and fuses information from the other functional areas. It provides an integrated representation of the battlespace or a specific area of concern.

(2) Fire Support. Fire support integrates naval fire support coordination and planning and interfaces with joint and combined fires. It supports MAGTF-level fire support coordination if there is more than one GCE within a MAGTF.

(3) Intelligence. Intelligence supports the employment of reconnaissance, surveillance, and target acquisition resources and the timely planning and processing of all-source intelligence. It ensures that all-source tactical intelligence is tailored to meet specific mission requirements.

(4) Air Operations. Air operations coordinate and plan Navy and Marine air combat operations and interface with joint and combined forces air operations. It also interfaces with fire support control.

(5) Combat Service Support. Combat service support ensures effective administrative and logistics planning and operations. This includes manpower management and all logistics functions that support deployment, employment and reconstitution of forces.

(6) Command and Control Warfare. Command and control warfare coordinates counter-command and control and command and control protection actions in support of command and control warfare operations.

c. Information Exchange. An information exchange system supports and controls the flow of information throughout the MAGTF. The information exchange system [1] is composed of an information processing system and a communications system. It controls the exchange of information among the six command and control functional areas at each echelon. It also controls the communications system that interfaces each echelon with the MAGTF. Communications paths [2] are determined by user location and need.

d. Surveillance. Modern warfare requires that the commander have the means to "sense" the battlespace as a whole. The MAGTF commander has a wide range of surveillance assets (internal and external to the MAGTF) available to support the surveillance subsystem. Internal surveillance assets range from reconnaissance units on the ground to sophisticated ground and airborne sensor systems. External surveillance assets are operated by diverse organizations and range from highly sophisticated, space-based sensors to tactical systems and specialized forces. Some external assets are part of a national inventory of sensors. Other external assets are operated at the theater level by allies or attached to tactical platforms. The surveillance subsystem employs multiple sensors in a complementary manner and forms an integrated surveillance grid that can quickly concentrate on any part or all of the battlespace to acquire, engage, and assess damage rapidly on selected targets.

e. Control of Command and Control Support Forces. The unified effort of command and control support forces is crucial to the effective processing and flow of command and control information. Task organization and employment of command and control support forces require detailed and continuous planning, direction, and coordination to sustain operations. Many command and control support forces are located within subordinate commands throughout the MAGTF and operate under the cognizance of the subordinate commanders. When the MAGTF is operationally employed, command and control support forces not only process information within their commands, but they also interface into the MAGTF network. Electronic command, control, communications, computers and intelligence (C^4I) systems supporting current and future networks operate at high speeds, leaving no time for coordination through command and staff channels. Therefore, the commander depends on the technical direction of command and control support forces through network and nodal control centers. Much of this direction is machine-to-machine while other directions must be between network and nodal control personnel. C^4I network control provides technical management of system configuration and resources, performance, fault isolation, security, and system planning and engineering.

4003. C^2 Support System Functions

The C^2 support system facilitates the command and control process through its six basic functions: collecting, transporting, processing, disseminating, and protecting information and countering enemy command and control (see fig. 13).

a. Collecting. Collecting is the gathering of information, based upon a need, and then the conversion of that information into a suitable form for transportation and use. Collecting is usually planned; however, it may happen by chance. Collecting is performed in various ways—from the Marine on patrol to space-based reconnaissance systems. In addition, the collection effort must be accomplished within the required time to ensure its usefulness. During collection, information is sorted, or filtered, based upon the commander's critical information requirements.

b. Transporting. Transporting is the moving of information by various means (e.g., electronically, by couriers, visually) to its appropriate location for processing. The commander at every echelon must have access to the information required to accomplish his mission. Therefore, all levels of command must have access to any and all available information.

c. Processing Processing is the filtering, fusing, and reducing of information into minimum, yet essential, details. Processing also includes the displaying, monitoring, and reporting of information in support of the commander's decision cycle. Whether done by individuals, staffs, or automated systems, the processing of information occurs at all levels of the MAGTF.

The display of information is tailored to the commander's need and intent. Effective displays provide a complete, easily understood presentation of the situation, thereby saving the commander time. The commander decides what he must personally review and determines the priority of presentation. By monitoring information internal and external to his command, the commander maintains his situational awareness.

The commander determines reporting requirements based on critical information requirements. If possible, redundant or known information (e.g., position location, imagery) is automatically collected and forwarded by automated systems to the point of need. Manual reporting is reduced to the absolute minimum.

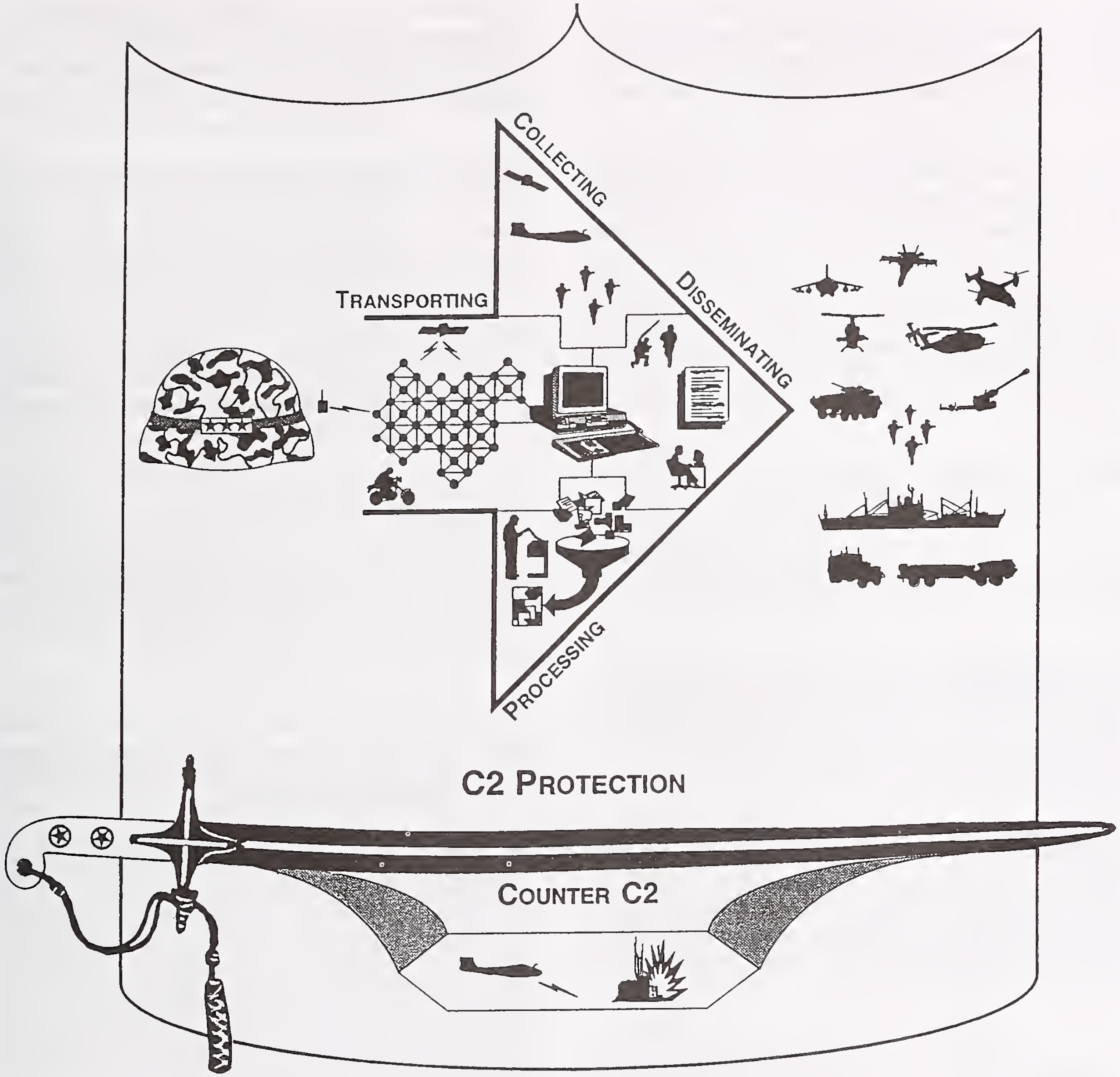

Figure 13. Command and Control Support Functions.

d. Disseminating. Disseminating is the distribution of processed information, with the addition of human insight, vision, and direction, to its appropriate user. The commander determines what information is disseminated to everyone, to designated units or elements (higher, lower, adjacent), or to key individuals. The commander also establishes the priority of information. If possible, dissemination is predetermined and automated to avoid delaying receipt of critical information.

e. Protecting. Protecting information is the first part of command and control warfare strategy. It includes active and passive measures taken to prevent the enemy's access to friendly command and control.

f. Countering Enemy Command and Control. Countering enemy command and control is the final part of command and control warfare strategy. It includes nonlethal and lethal attacks on enemy command and control to manipulate or deny enemy commanders the ability to command and control their forces effectively and must be supported by our C^2 support system.

4004. C^2 Support System Characteristics

If the C^2 support system is to meet its objectives, it must possess the following characteristics.

a. Deployability. The C^2 support system must support any size of MAGTF during any mode of deployment (e.g., amphibious shipping, maritime prepositioning ships, airlift).

b. Mobility. The MAGTF's philosophy of maneuver warfare requires that its C^2 support system be as mobile as the elements/units it supports. The rapid emplacement and displacement of combat operations centers should not degrade information quality or flow.

c. Survivability. The C^2 support system must survive lethal and nonlethal attack and continue its mission. It also must be capable of operating in a degraded mode if facilities or equipment fail or become damaged or destroyed.

d. Sustainability. The C^2 support system must provide continuous support during any type and length of operation. Quality, uninterrupted information must flow from top to bottom, bottom to top, and laterally within the MAGTF and with joint/combined forces as required.

e. Flexibility. The commander task organizes the C^2 support system as the situation dictates to provide the support required. The C^2 support system must be flexible enough to change as the situation changes.

f. Integration. The C^2 support system integrates MAGTF command and control organizations. Hence, the integration of command and control support contributes directly to achieving unity of effort and tempo and enables the decisive application of combat power. The synchronization of the MAGTF depends on the integration of all internal MAGTF command and control support forces in order to facilitate rapid response to change.

g. Interoperability. If a MAGTF is operating in a joint task force or coalition campaign, command and control interface with forces external to the MAGTF is mandatory. Interoperability[3] requires that the MAGTF C^2 support system interface directly with the C^2 support systems of higher, adjacent, and subordinate joint or combined forces.

4005. MAGTF Command and Control Support Forces

a. Command Element. The SRIG is the MAGTF's primary command and control support force that extends the commander's "eyes" and "ears" throughout the battlespace. The SRIG provides the commander with operational-level command and control support expertise. It is the MAGTF's primary resource for collecting, transporting, processing, disseminating, and protecting information both internal and external to the MAGTF.

The main product of the SRIG is information. The main service of the SRIG is the processing and transporting of information to ensure it gets to the right place at the right time in a form that can be used rapidly. The SRIG performs four critical functions:

- Interfaces the MAGTF with external strategic and operational command and control and information collecting systems.

- Extends the MAGTF's tactical command and control to its major subordinate commands.
- Consolidates all of the operational-level information and certain enhanced capabilities of the MAGTF into one organization. [4]
- Supports the commander's management of information processing and flow.

The principal command and control facilities of the MAGTF command element are—

Afloat:
Landing force operations center (LFOC)
Tactical-logistical group (TACLOG)
Supporting arms coordination center (SACC)
Joint intelligence center (JIC)

Ashore:
Combat operations centers
Fire support coordination center
Intelligence center

b. Aviation Combat Element. The Marine air control group is the primary command and control support force within the Marine aircraft wing. The organizations within this group support the Marine air command and control system for the ACE. The SRIG provides general support to the Marine air control group and interfaces the ACE with the MAGTF command element and external joint/combined aviation forces. The Marine air command and control system enables the ACE commander to plan, direct, coordinate, and control airspace and air operations within an assigned sector. It also coordinates adjacent airspace and air operations with joint/combined forces. The principal command and control facilities within the ACE are—

Afloat:
Helicopter direction center (HDC)

Ashore:
Tactical air command center (TACC)
Tactical air direction center (TADC)
Tactical air operations center (TAOC)
Direct air support center (DASC)
Marine air traffic control facility (MATCF)

c. Ground Combat Element. GCE headquarters is supported by a headquarters and service battalion or company (depending on the size of the GCE) from the Marine division. This organization contains the primary command and control support forces within the GCE. The SRIG provides general support to these forces and interfaces the GCE with the MAGTF command element. The principal command and control facilities within the GCE are—

Afloat:
Landing force operations center (LFOC)
Tactical-logistical group (TACLOG)
Supporting arms coordination center (SACC)

Ashore:
Combat operations center
Fire direction center
Fire support coordination center
Intelligence center

d. Combat Service Support Element. CSSE headquarters is supported by a headquarters and service battalion or company (depending on the size of the CSSE) from the force service support group. This organization contains the primary command and control support forces within the CSSE. The SRIG provides general support to these forces and interfaces the CSSE with the MAGTF command element and administrative and logistics organizations external to the MAGTF. The principal command and control facilities within the CSSE are—

Afloat:
Tactical-logistical group (TACLOG)

Ashore:
Force movement control center
Combat service support operations center

4006. Enabling Command and Control for the Future

In the last century, war began when guns sounded, shots fell within another country's territory, or troops crossed an international boundary. By the 21st century, the current understanding of what constitutes hostile action may not apply. The first shot fired could be the manipulation of information to skew public opinion or to render military C^2 support systems ineffective. Therefore, our C^2 support system will have to keep pace with technology, and the importance of command and control warfare will increase. Our future operating environment is characterized by unstable political and military situations, the downsizing of military forces, and the dramatic impact of technological advances. Ultimately, we will have to do more with fewer resources, and commanders at all levels will have to make decisions faster than ever before. Our future operating environment will increase the demand for information, require streamlined organizational structure, and require improved C^2 support systems.

Communications and information technology is accelerating at a staggering rate. Commercial satellites continue to improve communications and are increasingly more diverse. The divisions between commercial and military users in a commercial network will continue to blur. High resolution imagery will not be limited to superpower nations.

A reduced military force structure will change manpower policies and the organization of Marines and equipment—all of which drive our command and control organization. Our manpower policy will have to meet peacetime structure levels, yet still empower the MAGTF to rapidly build up for war. Commanders at all levels will have to review their missions and concepts of operation continuously and carefully balance divisions of labor, responsibility, and authority between their staff and subordinate commands. Traditional staff organizations will change and some functions or tasks may become obsolete, shift to a subordinate command, or be automated.

In addition, the downsizing of military forces and the shrinking defense budget will require that many combat operations be joint and/or combined. This will demand an increased reliance on command and control interoperability. A new, global command and control infrastructure will form widely distributed, user-driven networks in which joint forces “plug in” to improve speed of action, provide direct command and control interface, and unify joint and combined operations.

To meet the future and thrive in an environment of uncertainty and technological change, we must improve—

- Automation of information processing and flow.
  - Distributed networking.
  - Decision support.
- Display of information.
  - Common “picture” of the battlespace.
  - Replace narrative messages with a multimedia format.
- Control of command and control support forces and networks.
  - Tactics.
  - Structure.
- Intelligence on short notice.
  - Instant access to strategic, theater, and tactical assets.
  - Time-sensitive combat information in near-real-time.

Epilogue

Fighting Smart!

Marine command and control is a complex endeavor that impacts nearly every aspect of the MAGTF. Our philosophy of command and control has reduced this complexity through the use of a concept-based, vice technology-based, approach that links decision-making to execution. As part of our combined-arms strategy, this approach reflects the way the commander perceives and thinks about command and control, and the way he takes actions to influence his MAGTF and the enemy. His decisions are linked to execution via a central theory and philosophy that are based on a human focus.

To execute his decisions, the commander uses **information** as a principal tool of influence. His influence is then extended to the force by focusing and balancing his **command and control organization** and **C² support system.** The interrelationships that have been developed among information, organization, and the C² support system allow the commander to view command and control as a whole in order to identify how it should be structured, identify where it can be improved, and focus and balance limited resources to their best advantage.

When we apply the theory and principles to the realities of a working command and control system, they blur, becoming nearly indiscernible. However, it is clear that the proper management of information is essential to thrive in an environment of uncertainty. Like the abstract nature of the art of war, information management is an art that is developed through education and experience. Effective information management is the fundamental basis for focused, efficient command and control, and it drives the relationships between command and control organization and the C² support system.

To ensure the timely flow and processing of information, the commander must balance the division of labor between command and control organization and the C² support system. The key is that people and automation have complementary capabilities and limitations that must be applied accordingly. Where judgment is needed, you need people; where the rapid retrieval and manipulation of data is needed, you need computers. Balancing the division of labor between staff and automated information processing determines the quality of information. Quality information, combined with proper focusing of command responsibility and staff authority within the command and control organization, will improve speed of action.

Our future challenge is to conduct increasingly complex maneuver warfare operations in joint/combined environments with a finite amount of command and control resources. The commander will have to depend on information that, to a large extent, has been prepared and processed electronically. Once again, balance will be the key. We must avoid total dependency on technology, but use technology wisely. Automated systems have limitations that, if not understood, create illusions of accuracy or mask uncertainty. For example, a tactical data system's display may reveal that enemy forces do not occupy a given battlespace because the enemy is located just outside the range of a radar or has in some way disabled a sensor. Therefore, the commander must understand the capabilities and limitations of his C² support system as well as he understands his weapons and mobility systems. Creativity, imagination, and an innovative spirit will develop the art of information management and allow the commander to quickly and decisively exploit the MAGTF's potential combat power.

Since information drives command and control organization and the C² support system, it should be no surprise that the commander must first determine his information requirements to allow proper task organization of his command and control system. He begins by asking the same general questions (commander's critical information requirements) that he would use to orient himself to the combat situation. He then uses commander's critical information requirements to task organize the total command and control system. Figure 14 illustrates an example of a basic analysis between commander's critical information requirements and command and control system resources. The ultimate goal is to mold the total command and control system around the commander.

The commander's ability to distinguish between the ideal and the possible is fundamental to the art of command and essential when orchestrating the total command and control system. Once the system is established, the complexity and dynamics of the command and control system frustrate rationalistic attempts to change or improve an individual part of the system. Viewing and changing any one part of the system in isolation may create another problem (e.g., the addition of a new intelligence system may appear to solve a current problem; but, in reality, it creates yet another interface problem). The key to an effective command and control system is the constant fine-tuning of the whole, making an adjustment here and an adjustment there to minimize the requirement for major changes. However, occasionally, conditions may indicate that major changes are necessary.

Recognizing the interdependence of the total command and control system and the balances required, we start thinking in terms of adjustments that improve the total system rather than changes or fixes that will make the system perfect. Our command and control system does not have to be fancy or new—it just has to work faster than the enemy's. Therefore, balance is extended to command and control warfare. The more effective our command and control warfare operations, the more effective our command and control is in any given battlespace.

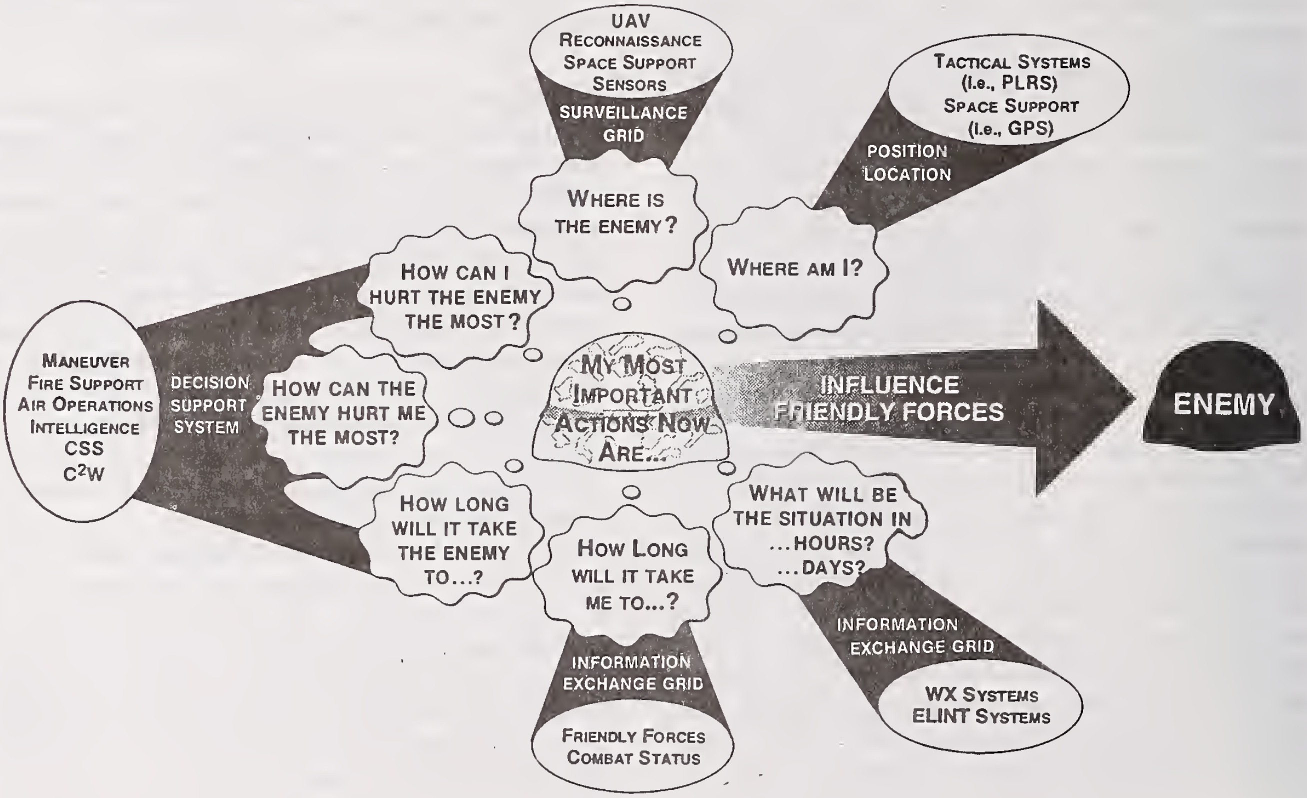
UAV
Reconnaissance
Space Support
Sensors
Surveillance Grid
Tactical Systems (i.e., PLRS)
Space Support (i.e., GPS)
Position Location
Where is the enemy?
Where am I?
How can I hurt the enemy the most?
Maneuver
Fire Support
Air Operations
Intelligence
CSS
C²W
Decision Support System
How can the enemy hurt me the most?
My Most Important Actions Now Are...
Influence Friendly Forces
Enemy
How long will it take the enemy to...?
How long will it take me to...?
What will be the situation in ...hours? ...days?
Information Exchange Grid
WX Systems
ELINT Systems
Information Exchange Grid
Friendly Forces Combat Status

Figure 14. Focusing the System to the Mission.

It is clear that our command and control system is the principal tool used by the MAGTF commander to influence his force and the enemy (see fig. 15). Meeting the challenges of the future demand realistic exercises; evolutionary fine-tuning; and clarification of tactics, techniques, and procedures to ensure effective command and control. Focusing and balancing our command and control system to the mission produces a synergistic effect that generates unity, speed, and agility, and gives the MAGTF the responsiveness it needs, throughout any battlespace, to fight smarter.

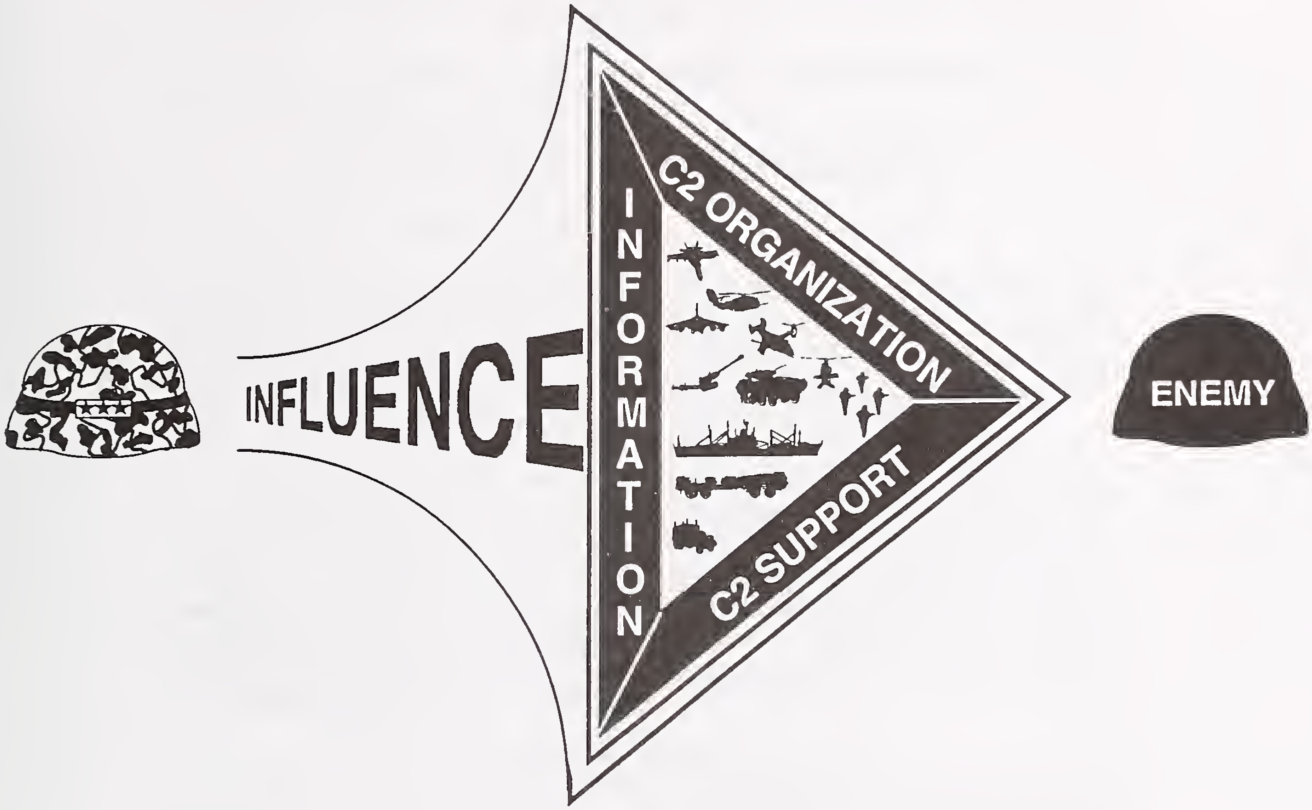

Figure 15. Command and Control: The Commander's Tool of Influence.

Notes

Foreword

1. Carl von Clausewitz, *On War*, trans, and ed. M. Howard and P. Paret (Princeton, NJ: Princeton University Press, 1984) p. 119.

2. Samuel B. Griffith II, *The Battle of Guadalcanal*, (Philadelphia and New York: J.B. Lippincott Co, 1963) p. 14.

Command and Control Fundamentals

1. Clausewitz, *On War*, p. 87.

2. Command and control infrastructure includes commanders, forces, and resources, structured into command and control organizations, combined with a command and control support system of people, equipment, communications, facilities, and procedures that control the flow and processing of information to support decisionmaking and ensure mission execution.

3. Joint Pub 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 1989, p. 384: "**unified command** – *(DOD)* A command with a broad continuing mission under a single commander and composed of significant assigned components of two or more Services, and which is established and so designated by the President, through the Secretary of Defense with the advice and assistance of the Joint Chiefs of Staff, or, when so authorized by the Joint Chiefs of Staff, by a commander of an existing unified command established by the President."

4. Joint Pub 1-02, p. 340: "**specified command** – *(DOD)* A command that has a broad continuing mission and that is established and so designated by the President through the Secretary of Defense with the advice and assistance of the Joint Chiefs of Staff. It normally is composed of forces from but one Service."

5. Joint Pub 1-02, p. 73, provides two definitions for combatant command. The definitions are as follows:

"**combatant command** – *(DOD)* One of the unified or specified commands established by the President."

"**Combatant Command (command authority)** – *(DOD)* Non-transferable command authority established by title 10, United States Code, section 164, exercised only by commanders of unified or specified combatant commands. Combatant Command (command authority) is the authority of a Combatant Commander to perform those functions of command over assigned forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction over all aspects of military operations, joint training, and logistics necessary to accomplish the missions assigned to the command. Combatant Command (command authority) should be exercised through the commanders of subordinate organizations; normally this authority is exercised through the Service component commander. Combatant Command (command authority) provides full authority to organize and employ commands and forces as the CINC considers necessary to accomplish assigned missions. Also called **COCOM**."

6. Joint Pub 6-0, *Command, Control, Communications and Computer Systems*, 1992: "**architecture**—*(DOD)* A framework or structure that portrays relationships among all the elements of the subject force, system, or activity." Approved for inclusion in Joint Pub 1-02.

7. Command and control interface refers to the employment of mutually accepted command and control organizational standards and/or command and control support systems to ensure the smooth coordination and interaction between forces.

8. Joint Pub 1-02, p. 77.

9. FMFM 1, *Warfighting*, p. 59.

10. Ernest B. Furgurson, *Chancellorsville 1863: The Souls of the Brave*, (New York, NY: Knopf, 1992) p. 142.

11. Stephen W. Sears, *Landscape Turned Red: The Battle of Antietam*, (New Haven: Ticknor and Fields, 1983) p. 314.

12. FMFM 1, p. 75.

13. CJCS MOP 30, *Command and Control Warfare*, 1993, p. 2-1: **command and control warfare (C^2W)**—"The integrated use of operations security (OPSEC), military deception, psychological operations (PSYOP), electronic warfare (EW) and physical destruction, mutually supported by intelligence, to deny information to, influence, degrade or destroy adversary C^2 capabilities, while protecting friendly C^2 capabilities against such actions. Command and control warfare applies across the operational continuum and all levels of conflict. Also called **C^2W**. (Proposed by draft CJCS MOP 30 for inclusion in Joint Pub 1-02 as a replacement for command, control, and communications countermeasures.) C^2W is both offensive and defensive:

(1) Counter-C^2. To prevent effective C^2 of adversary forces by denying information to, influencing, degrading or destroying the adversary C^2 system.

(2) C^2-Protection. To maintain effective C^2 of own forces by turning to friendly advantage or negating adversary efforts to deny information to, influence, degrade, or destroy the friendly C^2 system."

14. A.A. Vandergrift, *Battle Doctrine for Front Line Leaders*, (Third Marine Division, 1944) p. 7.

15. Joint Pub 1-02, p. 180: "**information**—*(DOD) 2. The meaning that a human assigns to data by means of the known conventions used in their representation.*"

16. *Thomas P. Coakley, Command and Control for War and Peace*, (Washington, DC: National Defense University Press, 1992) p. 177.

Organization for Command and Control

1. Joint Pub 1-02, p. 77: "**command**—*(DOD)* 1. The authority that a commander in the military Service lawfully exercises over subordinates by virtue of rank or assignment. Command includes the authority and responsibility for effectively using available resources and for planning the employment of, organizing, directing, coordinating, and controlling military forces for the accomplishment of assigned missions. It also includes responsibility for health, welfare, morale, and discipline of assigned personnel. 2. An order given by a commander; that is, the will of the commander expressed for the purpose of bringing about a particular action. 3. A unit or units, an organization, or an area under the command of one individual. . . "

2. Coakley, *Command and Control for War and Peace*, p. 103.

3. The following definition is proposed for inclusion in Joint Pub 1-02: **command and control support system**—An organized assembly of C²S forces or elements task organized and arrayed to overlay the C² infrastructure with C² support that collects, transports, processes, disseminates, and protects information essential to the commander and subordinate elements in the generation and decisive application of combat power. A command and control support system includes subsystems that support command, control, communications, computers, surveillance, reconnaissance, intelligence, interoperability, C² protection, and counter C² operations, their associated resources, and technology. Also called a **C²S system**.

4. The following definition is proposed for inclusion in Joint Pub 1-02: **commander's critical information requirements**—Decisive information the commander deems critical to prepare the battlespace and lead to decisions that prompt decisive action, create vulnerabilities, and bring about swift victory. Commander's critical information requirements are also the commander's tool used to focus the staff and the task organization/employment of command and control support forces to effectively manage the processing and flow of information. Also called **CCIR**.

5. FMFM 1, p. 63.

6. There are four types of staffs the commander can use:

A **personal staff** is directly responsible to a general. Normally, they are composed of aides (typically officers), a sergeant major, and the general's personal secretaries (typically officers). Except for the sergeant major, personal staffs exist only in units commanded by general officers.

A **general staff** is "a group of officers in the headquarters of Army or Marine divisions, Marine brigades and aircraft wings, or similar or larger units that assist their commanders in planning, coordinating, and supervising operations. A general staff may consist of four or more principal functional sections: personnel (G-1), military intelligence (G-2), operations and training (G-3), logistics (G-4), and (in Army organizations) civil affairs/military government (G-5).

(A particular section may be added or eliminated by the commander, dependent upon the need that has been demonstrated.) . . . In Army brigades and smaller units and in Marine Corps units smaller than a brigade or aircraft wing, staff sections are designated S-1, S-2, etc., with corresponding duties; referred to as a unit staff in the Army and as an executive staff in the Marine Corps." (Joint Pub 1-02, p. 156)

An **executive staff** is a group of officers in the headquarters of a Marine unit that is smaller than a Marine brigade or aircraft wing.

A **special staff** includes all the "staff officers having duties at a headquarters and not included in the general (coordinating) [or executive] staff group or in the personal staff group. The special staff includes certain technical specialists and heads of services; e.g., quartermaster officer, antiaircraft officer, transportation officer, etc." (Joint Pub 1-02, p. 340)

7. The following definition is proposed for inclusion in Joint Pub 1-02: **C² support forces**—The personnel, equipment, facilities, communications, and procedures involved with reconnaissance, surveillance, intelligence, fire support coordination, tactical air control, electronic warfare, automated data processing, sensor management, signals intelligence, deception, space systems, and other information-related areas. Also called **C²S forces.**

8. Joint Pub 1-02, p. 88: "**control**—*(DOD)* 1. Authority which may be less than full command exercised by a commander over part of the activities of subordinate or other organizations. . . ."

9. Joint Pub 1-02, p. 5: "**administrative control**—*(DOD, NATO)* Direction or exercise of authority over subordinate or other organizations in respect to administrative matters such as personnel management, supply, services, and other matters not included in the operational missions of the subordinate or other organizations." Also called **ADCON**.

10. Joint Pub 1-02, p. 262-263: "**operational control**—*(DOD)* Transferable command authority which may be exercised by commanders at any echelon at or below the level of combatant command. Operational control is inherent in Combatant Command (command authority) and is the authority to perform those functions of command over subordinate forces involving organizing and employing commands and forces, assigning tasks, designating objectives, and giving authoritative direction necessary to accomplish the mission. Operational control includes authoritative direction over all aspects of military operations and joint training necessary to accomplish missions assigned to the command. Operational control should be exercised through the commanders of subordinate organizations; normally this authority is exercised through the Service component commanders. Operational control normally provides full authority to organize commands and forces and to employ those forces as the commander in operational control considers necessary to accomplish assigned missions. Operational control does not, in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training. Also called **OPCON**."

11. Joint Pub 1-02, p. 361: "**tactical control**—*(DOD, NATO)* The detailed and, usually, local direction and control of movements or maneuvers necessary to accomplish missions or tasks assigned. (DOD Note: Also called **TACON.**)"

12. Joint Pub 3-09, *Doctrine for Joint Fire Support*, June 1991, p. GL-10: "**coordination**—The action or actions necessary to integrate the efforts of different organizations or activities. Coordination is required in such matters as fire support, emergency defense measures, area intelligence, and other situations in which integrated actions are necessary to ensure the efficiency or effectiveness of attaining an objective." This definition is proposed for inclusion in Joint Pub 1-02.

13. Marine Corps Manual, 1980, p. A-4.

14. Joint Pub 1-02, p. 267: "**organic**—*(DOD)* Assigned to and form[s] an essential part of a military organization. Organic parts of a unit are those listed in its table of organization for the Army, Air Force, and Marine Corps, and are assigned to the administrative organizations of the operating forces for the Navy."

15. Joint Pub 1-02, p. 38: "**assign**—*(DOD, NATO)* To place units or personnel in an organization where such placement is relatively permanent, and/or where such organization controls and administers the units or personnel for the primary function, or greater portion of the functions, of the unit or personnel."

16. Joint Pub 1-02, p. 39: "**attach**—*(DOD)* The placement of units or personnel in an organization where such placement is relatively temporary."

17. Joint Pub 1-02, p. 112: "**detachment**—*(DOD, NATO)* 1. A part of a unit separated from its main organization for duty elsewhere. 2. A temporary military or naval unit formed from other units or parts of units."

18. Joint Pub 0-2, *Unified Action Armed Forces*, (December 1986, Change 1 April 1989, p. 3-17—3-18) provides guidance on the exercise of support.

"**a.** Support is the action of a force that aids, protects, complements, or sustains another force in accordance with a directive requiring such action, or a unit in battle such as aviation, artillery or naval gunfire used as a support for infantry, or an element of a command that assists, protects, or supplies other forces in combat.

(1) Mutual support is the action that units render each other against an enemy because of their assigned tasks, their position relative to each other and to the enemy, and their inherent capabilities.

(2) General support is the action that is given to the supported force as a whole rather than to a particular subdivision thereof.

(3) Direct support is a mission requiring a force to support another specific force and authorizing it to answer directly the supported force's request for assistance.

(4) Close support is the action of the supporting force against targets or objectives that are sufficiently near the supported force as to require detailed integration or coordination of the supporting action with fire, movement, or other actions of the supported force.

b. Unless limited by the establishing directive, the commander of the supported force will have the authority to exercise general direction of the supporting effort. General direction includes the designation of targets or objectives, timing and duration of the supporting action and other instructions necessary for coordination and efficiency.

c. The supported commander should consider the accepted tactical practices of the Service of the supporting force. Normally, the supporting commander will be permitted to prescribe the tactics, methods, communications, and procedures to be employed by elements of the supporting force.

d. The supporting commander has the responsibility to ascertain the needs of the supported force and take such action to fulfill them as is within existing capabilities, consistent with priorities and requirements of other assigned tasks.

e. The establishing directive will indicate the purpose, in terms of the effect desired, and the scope of the action to be taken."

19. Joint Pub 1-02, p. 208: "**liaison**—*(DOD, NATO)* That contact or intercommunication maintained between elements of military forces to ensure mutual understanding and unity of purpose and action."

20. Joint Pub 1-02, p. 78: "**command post**—*(DOD, NATO)* A unit's or subunit's headquarters where the commander and the staff perform their activities. In combat, a unit's or subunit's headquarters is often divided into echelons; the echelon in which the unit or subunit commander is located or from which he operates is called a command post."

21. Joint Pub 1-02, p. 24: "**alternate command post**—*(DOD)* Any location designated by a commander to assume command post functions in the event the command post becomes inoperative. It may be partially or fully equipped and manned or it may be the command post of a subordinate unit."

22. See Joint Pub 3-02, *Joint Doctrine for Amphibious Operations*, for a detailed discussion on command relationships in an amphibious operation.

Command and Control Information Management

1. The following definition is proposed for inclusion in Joint Pub 1-02: **information**—Information is symbols (e.g., numbers, letters, words, graphics, visual images, sounds, smells, or physical contact) whether they represent something concrete or abstract, that give visualization or convey a thought. A given symbol, or piece of information, may be meaningless by itself. However, combining pieces of information produces ideas or provides knowledge. When ideas are structured into logical patterns they produce concepts or frameworks from which plans are formed and, ultimately, information is managed. There are basically two sources of information, original or existing: Original sources are first witnesses to the information, be it a human or automated observation, or the intellectual creation of an idea. Existing sources of information are already stored in some type of medium; for example, a book, microform, a computer, or someone's brain.

2. "The history of command can thus be understood in terms of a race between the demand for information and the ability of command systems to meet it. That race is eternal; it takes place within every military organization, at all levels and at all times . . . Taken as a whole, present-day military forces, for all the imposing array of electronic gadgetry at their disposal, give no evidence whatsoever of being one whit more capable of dealing with the information needed for the command process than were their predecessors a century or even a millennium ago." Martin Van Creveld, *Command in War*, (Cambridge, Massachusetts: Harvard University Press, 1985) p. 265.

3. Clausewitz, *On War*, p. 75.

4. Joint Pub 1-02, p. 96: "**critical information**—*(DOD)* Specific facts about friendly intentions, capabilities, and activities vitally needed by adversaries for them to plan and act effectively so as to guarantee failure or unacceptable consequences for friendly mission accomplishment."

5. Gary A. Klein, "*Strategies of Decision Making*," Military Review, May 1989, pp. 56-61.

6. Synchronization is both a process and a result that seeks to arrange battlespace activities in time, space, and purpose to produce maximum relative combat power at the decisive point.

7. Joint Pub 3-56, *Joint Command and Control*, draft, Sept 92. joint targeting coordination board, p. II-17; joint forces air component commander, p. IV-4.

8. See Joint Pub 3-56, *Joint Command and Control*, for more details.

Enabling Command and Control

1. **MAGTF information exchange system.** The MAGTF information exchange system forms a network that supports information flow (vertical and lateral) throughout the MAGTF on user demand. It requires a distributed communications grid or web of communications links that operate manually or are preferably automated through computer control. The distributed communications grid supports the flow of voice and data information between command and control facilities at nodal points (i.e., command post or control centers).

2. **communications paths.** Distributed communications grids do not use a given communications link for one specific purpose, but view it only as a path that could be used to move all types of information.

3. Joint Pub 1-02, p. 190: "**interoperability**—*(DOD, NATO)* 1. The ability of systems, units or forces to provide services to and accept service from other systems, units or forces and to use the services so exchanged to enable them to operate effectively together. *(DOD)* 2. The condition achieved among communications-electronics systems or items of communications-electronics equipment when information or services can be exchanged directly and satisfactorily between them and/or their users. The degree of interoperability should be defined when referring to specific cases."

4. With the exception of the aviation squadron's supporting aerial observation, the Marine tactical electronic warfare squadron, the light armored reconnaissance battalion of the Marine division, and the regimental intelligence assets, the SRIG consolidates all of the operational-level surveillance, reconnaissance, intelligence, communications, and certain special-operations capabilities of the MAGTF into one organization. The SRIG includes—

- Communications battalion.
- Radio battalion.
- Force reconnaissance company.
- Unmanned aerial vehicle company.
- Counterintelligence team.
- Interrogation platoon.
- Sensor control and management platoon.
- Topographic platoon.
- Imagery processing and analysis unit.

Special-operations capabilities include—

- Radio reconnaissance platoon of the radio battalion.
- Direct action platoon of the force reconnaissance company.
- Light contingency communications teams of the communications battalion.

Appendix A

Commander's Critical Information Requirements

The following list provides examples of the type of information that may be used as commander's critical information requirements and their potential source. The situation dictates the actual commander's critical information requirement's employed.

Enemy

Type of Information	Potential Source
Intelligence Unit (order of battle) Name Type Size Strength Weapons Equipment Equipment Activity	Order of battle handbook; DIA factbooks; spot reports; interrogator translator unit (ITU) reports; size, activity, location, unit, time, equipment (SALUTE) reports; shell reports; defense intelligence summary (DISUM); intelligence summary (INTSUM); counterintelligence reports; other national, theater, and tactical sources/sensors
Logistical Intelligence Transportation of troops Routes Rear area vulnerability assessment Landing support operations vulnerability	Terrain analysis; tactical maps; SALUTE reports; spot reports; shell reports; counterintelligence reports; ITU reports; DISUM; INTSUM; order of battle handbook; G-2 estimates; combat service support analysis; stockpiles,; other national, theater, and tactical sources/sensors
Capabilities What can he do? When can he do it? Where can he do it? In what strength?	G-2 estimates
Intentions Courses of action (attack, defend, etc.) Location of main attack Type of units/strength	G-2 estimates, INTSUM, DISUM

Type of Information	Potential Source
Enemy Indirect Fire Weapons	
Caliber	Surveillance and reconnaissance center (SARC)
Type	Countermortar radar, shell reports
Location	Spot reports
Current Operations	
Enemy engagement losses:	Subordinate unit spot reports
Killed in action	
Wounded in action	
Enemy prisoners of war	
Weapons	
Equipment	

Friendly

Type of Information	Potential Source
Current Operations	
Task organization	Operations and fragmentary orders
Mission	Operations and fragmentary orders
Tasks	Operations and fragmentary orders
Units:	
Name	Troop list and task organization
Type	Troop list and task organization
Size	Troop list and task organization
Location	Subordinate unit fragmentary orders and spot reports
Activity	Subordinate unit fragmentary orders and spot reports
Combat readiness	Subordinate unit spot reports
Mission-oriented protective posture (MOPP) alert status	G-3 analysis and subordinate unit spot reports
Control measures	Division operations and fragmentary orders
Adjacent and supporting units:	Operations and fragmentary orders
Name	
Type	
Size	
Location	
Activity	
Friendly engagement results:	Subordinate unit spot reports, close air support reports
Killed in action	
Wounded in action	
Missing in action	
Weapons	
Equipment	
Future Operations	
Task organization	Operations and fragmentary orders
Mission	Operations and fragmentary orders
Tasks	Operations and fragmentary orders
Units:	
Name	Troop list and task organization

Type of Information	Potential Source
Units: (continued)	
Type	Troop list and task organization
Size	Troop list and task organization
Location	Subordinate unit fragmentary orders and spot reports
Activity	Subordinate unit fragmentary orders and spot reports
Combat readiness	Subordinate unit spot reports
MOPP alert status	G-3 analysis and subordinate unit spot reports
Control measures	Operations and fragmentary orders
Adjacent and supporting units:	Operations and fragmentary orders
Name	
Type	
Size	
Location	
Activity	
Fire support:	
Artillery:	
Units	GCE operations and fragmentary orders
Designation	GCE operations and fragmentary orders
Caliber	GCE operations and fragmentary orders
Location	Fire capability reports
Activity	Fire capability reports
Mission	GCE operations and fragmentary orders
Weapon status	Fire capability reports
Ammunition status[1]	Fire capability reports
Naval fire support:	CATF and MAGTF operations and fragmentary orders
Name	
Type of weapons	
Position	
Mission	
Weapons status	
Ammunition status	
Air support:	
Mission	ACE operations and fragmentary orders
Units	ACE operations and fragmentary orders
Aircraft availability	Tactical air command center
Position	Tactical air command center
Ordnance	Tactical air command center
Close air support:	Air tasking order and DASC
Scheduled missions	
On call missions	
Air defense:	
Units	ACE operations and fragmentary orders
Designation	ACE operations and fragmentary orders
Type	ACE operations and fragmentary orders
Size	ACE operations and fragmentary orders
Location	DASC
Mission	ACE operations and fragmentary orders
Alert status	DASC

[1] Basic allowance and days of ammunition supply.

Type of Information	Potential Source
Air defense (continued)	
Weapons status	DASC
Ammunition status [1]	DASC
Target Acquisition Assets	
System	MAGTF operations order
Location	Fire support coordination center (FSCC), SARC
Cueing instructions	FSCC, SARC
Coordination Measures	MAGTF operations and fragmentary orders
Personnel	
Authorized strength	Personnel status and effectiveness reports (PSER)
Actual strength	PSER
Grade and MOS data	PSER
Battle losses:	Spot and close air support reports
Killed in action	
Wounded in action	
Missing in action	
Nonbattle losses:	Close air support reports
Illness (MEDEVAC)	
Injury (MEDEVAC)	
Nonbattle deaths	Close air support reports
Enemy prisoners of war captured	Subordinate unit spot reports
Logistics	
Supply:	Force service support group logistics summary
Class I (C)	
Class III (W)	
Class IV	
Class V (W)	
Class VIII	
Maintenance:	Spot reports and GCE logistics summary
M198 Howitzer	
M60A1 tank	
AAVP 7A1	
AAVC 7A1	
TOW	
C^2 Support System	
Communications network/ nodal status	Oral report from network/nodal control center
Information systems status	Oral report from network/nodal control center
Voice call signs	Appropriate communications security material
Call signs suffixes	Appropriate communications security material, clocks (local and ZULU)
Surveillance and reconnaissance	Oral report from SARC
Command and control warfare	Oral report from G-3 operations cell

[1] Basic allowance and days of ammunition supply.

Operating Environment

Type of Information	Potential Source
Exploitation of Urban Areas	
Facilities Communications Supply classes I, II, IV	DIA factbooks; terrain analysis; data base; area handbooks; G-2 estimates; naval intelligence processing system reports; other national, theater, and tactical sources/sensors
Facilities (CPs, airfields, vehicle parks, etc.)	
Type Size Location	SALUTE reports, DISUM, INTSUM, counterintelligence reports, ITU reports, spot reports
Terrain	
Terrain features	Terrain, intelligence, and amphibious studies; other national, theater, and tactical sources/sensors
Terrain compartments	Terrain, intelligence, and amphibious studies; other national, theater, and tactical sources/sensors
Barriers	Terrain, intelligence, and amphibious studies; other national, theater, and tactical sources/sensors
Avenues of approach	Terrain, intelligence, and amphibious studies; other national, theater, and tactical sources/sensors
Surface materials	Terrain, intelligence, and amphibious studies; other national, theater, and tactical sources/sensors
Hydrography	Terrain, intelligence, and amphibious studies; other national, theater, and tactical sources/sensors
Vegetation	Terrain, intelligence, and amphibious studies; other national, theater, and tactical sources/sensors
Cultural features	Terrain, intelligence, and amphibious studies; other national, theater, and tactical sources/sensors
Trafficability	Terrain, intelligence, and amphibious studies; G-2 estimates; other national, theater, and tactical sources/sensors
Effects on operations	G-2 estimates; other national, theater, and tactical sources/sensors
Weather	
Temperature, winds, humidity, visibility	Weather reports from CATF, MEF, or local agencies
Effects on operations	G-2 estimates
Astronomical Data	
Beginning morning nautical twilight, sunrise, sunset early evening nautical twilight, moonrise, moonset percentage of illumination	Astronomical studies
Effects on operations	G-2 estimates

Appendix B

Acronyms

ACE	aviation combat element
C^2	command and control
C^2support system	command and control support system
C^2W	command and control warfare
C^4I	command, control, communications, computers and intelligence
CATF	commander, amphibious task force
CCIR	commander's critical information requirements
CE	command element
CINC	Commander in Chief
CINCPac	Commander in Chief, Pacific
CLF	commander, landing force
CP	command post
CSS	combat service support
CSSE	combat service support element
DASC	direct air support center
DISUM	defense intelligence summary
DOD	Department of Defense
ELINT	electronics intelligence
FSCC	fire support coordination center
GCE	ground combat element
GPS	global positioning system
HDC	helicopter direction center
INTSUM	intelligence summary
ITU	interrogator translator unit
JCS	Joint Chiefs of Staff
JFACC	joint forces air component commander
JIC	joint intelligence center
JOPES	Joint Operation Planning and Execution System
JTCB	joint targeting coordination board
JTF	joint task force
LFOC	landing force operations center
MAGTF	Marine Air-Ground Task Force
MARFOR	Marine Forces
MATCF	Marine air traffic control facility
MCF	Marine contingency force
MEB	Marine expeditionary brigade
MEF	Marine expeditionary force
MEU	Marine expeditionary unit
MOPP	mission-oriented protective posture
NCA	National Command Authorities
PLRS	position location reporting system
PSER	personnel status and effectiveness report
SACC	supporting arms coordination center
SALUTE	size, activity, location, unit, time, equipment
SARC	surveillance and reconnaissance center
SRIG	surveillance, reconnaissance, intelligence group
TACC	tactical air command center
TADC	tactical air direction center
TACLOG	tactical-logistical group
TAOC	tactical air operations center
UAV	unmanned aerial vehicle
US	United States
WWMCCS	Worldwide Military Command and Control System
WX	weather

Appendix C

References and Related Publications

1. Allied Documents

Allied Communications Publications (ACPs)

149(D)	Radio Communications Instructions for Merchant Ships Under Naval Control, April 1983
150(D)	Recognition and Identification Instructions, Air, Land, and Sea Forces, July 1987
160	NATO Supplement 1(D), IFF MARK X (SIF) Policy and Procedures, May 1986
160	US Supplement 1(D), IFF MARK XII Standing Operating Procedures for the Identification of Friendly Military Aircraft and Ships, October 1984
160(B)	IFF/SIF Operational Procedures, June 1989
190	US Supplement 1(C), Guide to Frequency Planning

Allied Tactical Publication (ATP)

2	Volumes I and II, Allied Naval Control of Shipping Manual, June 1983

Standardization Agreement (STANAG)

5048	Minimum Scale of Communications for the NATO Land Forces Requirements, Principles and Procedures, Ed. 3, February 28, 1991

2. Joint Documents

Chairman, Joint Chiefs of Staff Memorandum of Policy (CJCS MOPs)

3	CJCS-Controlled Tactical Communications Assets, January 31, 1990
6	Electronic Warfare, March 6, 1993
7	Joint Strategic Planning System, March 17, 1993
8	Policy for Defense Switched Network Service, February 13, 1990
13	Improved Emergency Message Automatic Transmission System, June 17, 1992
14	AUTODIN and Associated Message Processing System, May 10, 1990

17	Critical Information Message Preparation and Communications Procedures, July 10, 1990
21	International Agreements, June 18, 1990
22	Telecommunications Economy and Discipline, June 13, 1990
28	Promulgation of Noncryptographic Allied Communications Publications, Supplements Thereto, and Joint Army-Navy-Air Force Publications, July 19, 1991
29	Joint Operations Security, August 24, 1990
30	Command and Control Warfare, March 8, 1993
37	Military Satellite Communications Systems, May 14, 1992
38	Defense Data Network and Connected Systems, August 28, 1990
40	Coordination of US C^3 Positions in International C^3 Forums, May 6, 1991
43	Military Telecommunications Agreements and Arrangements Between the United States and Regional Defense Organizations or Friendly Foreign Nations, March 11, 1992
45	Position Reference Procedures, September 14, 1990
46	International Military Rationalization, Standardization, and Interoperability between the United States and Its Allies, June 4, 1992
48	CJCS Worldwide Secure Voice Conferencing System, October 4, 1990
49	CJCS Alerting Network, October 15, 1990
50	Command, Control, and Communications System Master Plans, Assessments, and Evaluations, December 13, 1990
54	Joint and Combined Communications Security, November 20, 1990
77	Requirements Generation System Policies and Procedures, September 17, 1992

Joint Chiefs of Staff Memorandum of Policy (JCS MOPs)

116	Military Deception, March 24, 1987
160	Compatibility and Interoperability of Tactical Command, Control, Communications, and Intelligence Systems, January 7, 1986

Joint Publications

0-2	Unified Action Armed Forces (UNAAF), December 1, 1986 (Change 1, April 21, 1989)
1-02	Department of Defense Dictionary of Military and Associated Terms, December 1, 1989
1-03	Joint Reporting Structure (JRS) General Instructions, June 30, 1977
1-03.3	JRS, Status of Resources and Training System (SORTS), October 1, 1990
3-02	Joint Doctrine for Amphibious Operations, October 8, 1992

3-02.1	Joint Doctrine for Landing Force Operations, 1989
3-13	(S) C^{3}CM in Joint Military Operations (U), September 10, 1987
3-54	Joint Doctrine for Operations Security, August 21, 1991
3-56 series	Tactical Command and Control Planning Guidance and Procedures for Joint Operations
5-00.2	Joint Task Force Planning Guidance and Procedures, September 3, 1991
5-03.1 (test pub)	Joint Operation Planning and Execution System, Volume I (Planning Policies and Procedures), December 20, 1991
5-03.2	Joint Operation Planning and Execution System, Volume II (Planning and Execution Format and Guidance), March 10, 1992
5-03.21 (draft)	(S) Joint Operation Planning and Execution System, Volume II Supplement (Planning Execution Format and Guidance), Secret Supplement (U), March 10, 1992
6-0	Doctrine for C^4 Systems Support to Joint Operations, June 3, 1992
6-01.1	(C) Tactical Digital Information Link (TADIL) Message Standards (U), TADILs A/B/C, October 1, 1989
6-02	(S) Joint Doctrine for Operational/Tactical C^3 System (U), April 1, 1968 (under revision)
6-03 series	WWMCCS Objectives and Management Plan
6-04 series	US Message Text Formatting Program
6-05 series	Manual for Employing Joint Tactical Communications Systems

Major Command Manuals (MCMs)

50-93	Update of Tactical Warning and Attack Assessment Information Requirements of the JCS, April 1, 1993
57-93	Unified Command Plan, April 15, 1993
59-92	Joint Strategic Capabilities Plan (CY 1993-1995), Annex I, Command, Control, Communications, and Computer Systems, April 14, 1992
72-92	Management of the Command Center Processing and Display System, May 14, 1992
78-92	Operational Concept for the Ground Wave Emergency Network, June 3, 1992
90-92	Exchange of Communications, June 22, 1992
93-91	Basic Planning Directive for Civil Defense, Recovery, and Reconstitution, May 29, 1991
005-90	National Military Strategy Document (NMSD) (FY 1992-1997), Annex C, Command, Control, and Communications Systems, March 16, 1990
008-91	Contingency Communications between the Commander of a Joint Task Force and a US Diplomatic Post, January 16, 1991
015-90	Frequency Resource Record System, February 14, 1990

042-90 CJCS-Controlled Joint Task Force Communications Capability, June 1, 1990

172-91 Integrated Tactical Warning and Attack Assessment System Integration, October 1, 1991

206-91 US and Allied COMSEC Modernization, November 27, 1991

218-91 Intertheater COMSEC Package, December 16, 1991

Joint Chiefs of Staff Memorandums (MJCS)

28-93 JCS Communications Plan for Providing Presidential Communications Interface (HF and Satellite Communications), February 11, 1993

003-90 Charter for Centralized Direction, Management, Operation, and Technical Support of the Nuclear Command, Control, and Communications (C^3) Systems, June 8, 1990

131-92 JCS Master Navigation Plan, September 11, 1992

121-88 Changing Tactical Call Sign and Frequency Assignments, August 1, 1988

122-88 United States Representative to the NATO Allied Communications and Computer Security Agency, August 3, 1988

171-88 Training Responsibilities for the US Message Text Formatting Program, September 26, 1988

209-83 Defense Communications System Five Year Program Joint Validation Procedures, November 3, 1983

216-89 Transition from European Telephone System to Defense Switched Network—Europe, December 13, 1989

Staff Memorandum (SM)

102-83 Basic Planning Directive for Land Defense of the Continental United States and Military Support to Civil Defense, March 16, 1990

Miscellaneous

Command and Control Functional Analysis and Consolidation Review Panel Report, The Joint Staff, October 30, 1991

C^3 Architecture for JTF Headquarters, Defense Information Systems Agency, Joint Interoperability and Engineering Organization, Washington, D.C., July 13, 1992

The Joint Staff Officer's Guide, Armed Forces Staff College (AFSC) Pub 1, 1991

C^4I for the Warrior, C^4 Architecture and Integration Division, The Joint Staff, Washington, D.C., June 12, 1992

3. Department of Defense (DOD) Directives

2010.6	Standardization and Interoperability of Weapon Systems and Equipment within the North Atlantic Treaty Organization, March 5, 1980
2010.7	Policy on Rationalization of NATO and NATO Member Telecommunication Facilities (U), July 6, 1981
3020.26	Continuity of Operations Policies and Planning, October 24, 1985
3222.3	Department of Defense Electromagnetic Compatibility Program, July 5, 1967
3222.4	Electronic Warfare and Command, Control and Communications (C^3) Countermeasures, July 31, 1992
3600.1	(TS) Information Warfare (U), December 21, 1992
4600.3	Electronic Counter-Countermeasures (ECCM) Policy, March 12, 1990
4630.5	Compatibility and Interoperability of Tactical Command, Control, Communications, and Intelligence Systems, October 9, 1985
4650.1	Management and Use of the Radio Frequency Spectrum, June 24, 1987
5000.1	Defense Acquisition, February 23, 1991
5000.2	Defense Acquisition Program Procedures, February 23, 1991
5100.30	World-Wide Military Command and Control System (WWMCCS), Change 1, December 2, 1971
5100.35	Military Communications-Electronics Board, May 6, 1985
5100.79	Worldwide Military Command and Control System Engineer, November 21, 1975
5105.19	Defense Information Systems Agency (DISA), June 25, 1991
5105.44	Military Satellite Communications (MILSATCOM) Systems Organization, October 9, 1973
5160.32	Development of Space Systems, September 8, 1970
5200.28	Security Requirements for Automated Information Systems (AISs), March 21, 1988
5200.33	Defense Courier Service (DCS), September 30, 1987
5530.3	International Agreements, June 11, 1987
C-3100.9	Space Systems Policy, March 28, 1977
C-4605.2	Restoration Priorities for Military Communications Channels, Change 1, October 17, 1968
C-5200.5	Communications Security (COMSEC), October 6, 1981
S-5100.44	Master Plan for the National Military Command System, Changes 1-3, June 9, 1964

4. Navy Documents

Navy Tactical Publication (NTP)

4	Naval Communications System

Navy Warfare Publications (NWPs)

8	Command and Control
10-1	Composite Warfare Components

Miscellaneous

Space and Electronic Warfare, A Navy Policy Paper on a New Warfare Area, Space and Electronic Warfare Office, Commander, Naval Operations, April 1992

The Copernicus Architecture, Phase I: Requirements Definition, Copernicus Project Officer, Space and Electronic Warfare Office, Commander, Naval Operations, August 1991

Technology Initiatives Game 1991: Space and Electronic Warfare and C^3I *in 2010* (U), Center for Naval Analysis

5. Marine Corps Documents

Fleet Marine Force Manuals (FMFMs)

1	Warfighting
1-1	Campaigning
1-2	The Role of the Marine Corps in the National Defense
1-3	Tactics
2	The Marine Air-Ground Task Force
3-21	MAGTF Intelligence Operations
3-22	Surveillance, Reconnaissance, Intelligence Group
3-27	Aviation Intelligence (under development)
3-45	MAGTF Digital Communications Systems (under development)
4	Combat Service Support
4-3	Landing Support Operations (under development)
5-1	Organization and Function of Marine Aviation
5-52	Employment of the Low Altitude Air Defense Battalion

Fleet Marine Force Reference Publications (FMFRPs)

0-14	Marine Corps Supplement to the DOD Dictionary of Military and Associated Terms
1-11	Fleet Marine Force Organization—1992
2-12	Marine Air-Ground Task Force: A Global Capability
3-42	LHD 1 Class Command, Control, Communication, Computer, and Intelligence Systems (under development)
3-203	Lessons Learned: The Iran-Iraq War, Volume I
5-85	Aviation Equipment and Systems
12-82	Structuring the Marine Corps for the 1980's and 1990's
14-5	Marine Air Command and Control System Operational Concept (MACCS 2000)
14-7	Over-the-Horizon (OTH) Amphibious Operations Operational Concept
15-5	Electronic Warfare as a Combined Arms

Miscellaneous

Command and Control Concept for Maneuver Warfare and Over-the-Horizon Oper ations (1995-2010), March 1992, United States Marine Corps, Marine Corps Combat Development Command, Studies and Analysis Division

Marine Corps Manual, 1980

6. Miscellaneous Military Documents

Orr, George E., *Combat Operations C^3I: Fundamentals and Interactions*, Maxwell Air Force Base, Alabama, Airpower Research Institute, Air University Press, 1983

Vandergrift, A. A., *Battle Doctrine for Front Line Leaders*, Third Marine Division, 1944

7. Miscellaneous Documents

Campen, Alan D., *Science of Command and Control: Coping with Uncertainty,* AFCEA International Press, Washington DC, 1988

Coakley, Thomas P., *Command and Control for War and Peace*, Washington DC, 1992

Furgurson, Ernest B., *Chancellorsville 1863*: The Souls of the Brave, Knopf, New York, 1992

Griffith II, Samuel B., *The Battle of Guadalcanal*, J.B. Lippincott Co., Philadelphia and New York, 1963

Klein, Gary A. "Strategies of Decision Making," *Military Review*, May 1989

Sears, Stephen W., *Landscape Turned Red: The Battle of Antietam*, New Haven, 1983

Slim, William, *Defeat into Victory*, 2nd ed., Cassell and Co. Ltd, London, 1956

Van Creveld, Martin, *Command in War.* Harvard University Press, Cambridge, 1985.

von Clausewitz, Carl, *On War*, trans and ed. M. Howard and P. Paret, Princeton University Press, Princeton, 1984

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